COTTON

JUNE, 1912

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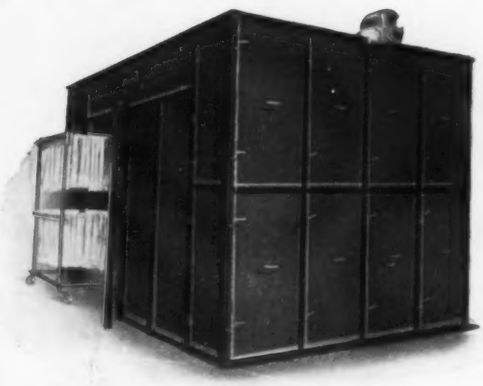

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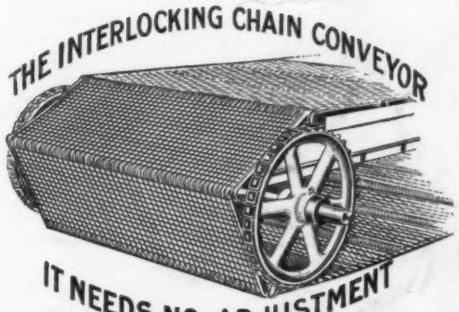

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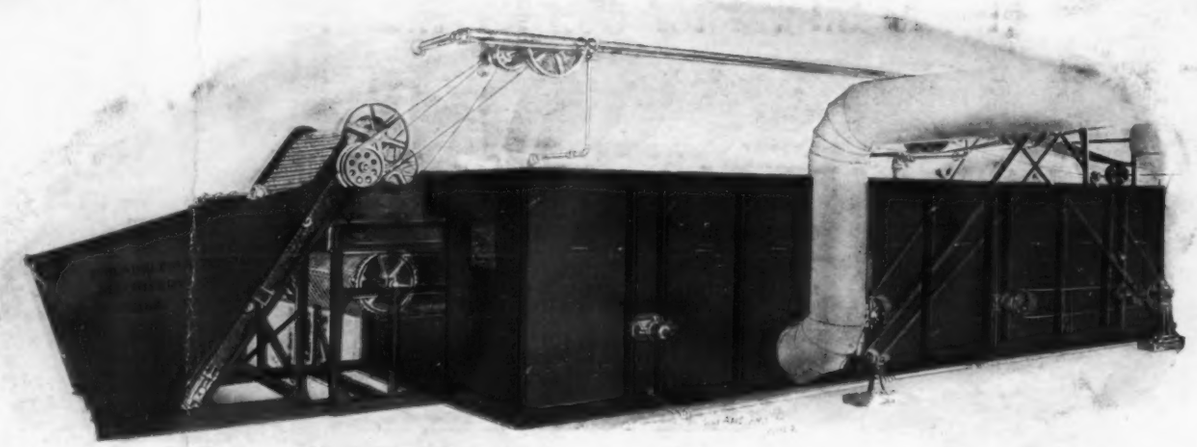

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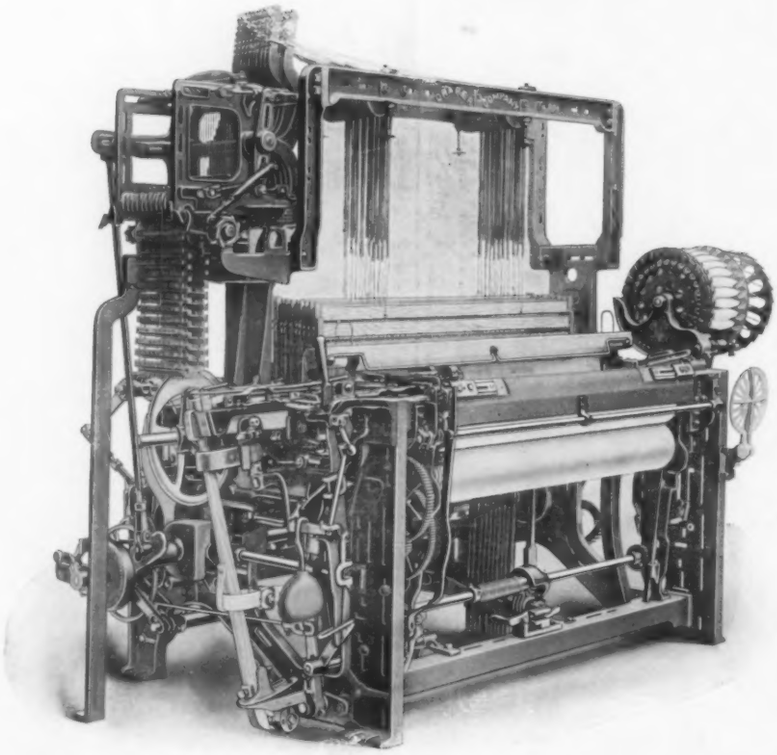

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(This Issue 5,000 Copies.)

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CONGRESSIONAL ECONOMY?

Congress occasionally does fearful and wonderful things and the present session is no exception to the general rule, particularly in its attempt to prove how economical it can be.

Sometime ago, when the so-called Sherwood pension bill came up, the House passed the measure appropriating 75 million dollars. The Senate however, balked at the price. Far be it from it to harm the old soldier, but half that amount should be enough for one year's appropriation. There were other years coming and so were other pension bills. So they compromised on approximately half of the original amount. When this bill reached the President, he hesitated, closed his eyes tightly, grasped his pen firmly and affixed his signature.

Immediately there arose much hue and cry from the people, or to be exact, from that section which would not be financially benefited either directly or indirectly by the passage of this bill. The House leaders and "wise heads," advised economy. There was an immediate search for some measure where they could economise without a boonerang. Pending before the House at this time was a measure known as the Legislative, Executive and Judical Appropriation Bill and here was found the opportunity.

First, it was decided to eliminate the Tariff Board. Nobody cared about the Tariff Board except the President and no one ever used the statistics complied; besides, they would present a substitute that could also be utilized by the House and Senate. Therefore, they passed an amendment changing the present Bureau of Manufactures of the Department of Commerce and Labor, into the "Bureau of Foreign and Domestic Commerce." Then they abolished the Bureau of Statistics in its old form and transferred the clerks to the new bureau, at the same time cutting the appropriation to $4,000 less than was provided for the Bureau of Statistics last year. Think of it! Four thousand dollars saved! They were, undoubtedly, beginning a campaign of economy. This same bill also abolishes the Bureau of Trade Relations in the Department of State, thereby saving nearly $70,000 more.

Seriously, such a move would be decidely unfortunate and it is to be hoped that this section of the amendment will be killed in the Senate. Huntington Wilson, Assistant Secretary of State, is regarding this move very seriously and it is worth while to call attention here to Mr. Wilson's published statement which follows:

"If the legislative, executive and judicial appropriation bill should stand as it has just passed the House it would wreck the whole reorganized Department of State, which has given the American people for the first time a modernized foreign office. By doing this it would almost nullify all the efforts of the whole diplomatic and consular service, because these are useless without an efficient State Department to direct them.

"In particular this astounding reactionary legislation if passed would destroy the divisions of Latin Amer-

ican, Far Eastern, Near Eastern and European affairs and would deprive the Department of the services of a dozen foreign service men who are attached to the Department in order to give advice from intimate personal knowledge and to carry on all the detail of important political and commercial diplomatic correspondence with each country. It would deprive the business men of the United States of the advantage that all of these men are able to give them in the way of accurate information. It would destroy the Bureau of Trade Relations, whose efficient efforts to expand American foreign trade have brought applause and expressions of appreciation from the manufacturers and business men of the whole country North, South, East and West.

"It is absured to say that the Bureau of Trade Relations was created entirely to apply the maximum and minimum tariff provisions, although if that were so it is obvious that the continued application of those provisions called for a continued watchfulness.

"This proposed legislation eliminates the director of the consular service, an office created to give that service, so vastly important to our commerce, the live and energetic direction essential to its present high efficiency, to say nothing of the offices of counsellor and resident diplomatic officer. This bill destroys the division of information, the only means by which two or three embassies co-operating for the same purpose are kept informed each of what the other is doing.

"Without further elaboration it may be said with absolute accuracy that such legislation would put the United States in the rear rank of all governments in the matter of legitimate and effective support to worthy American enterprises and to foreign commerce, and would do all this at the very epoch in our history when our foreign relations and our foreign trade have become vastly more important than ever before and are plainly to be seen to be on the way to an importance which will be every year greater to the manufacturer, the business man, the exporter, the farmer and the laborer of the United States.

"Before the reorganization three or four men were expected to handle the mass of the most heterogenous matters, Chinese, Latin American and what not. Result, a large majority of the opportunities to advance the national interests simply went by the board. It was physically impossible to do the work. Since the reorganization the business men of the country, finding in the department an up to date, effective machine to help them in their efforts for foreign trade, were at first surprised and then began eagerly taking advantage of the opportunities offered.

"The result is that the business of the department in promoting foreign trade, as indeed in all political and diplomatic directions as well, has incredibly increased. If all these instrumentalities are to be destroyed it will be far more severely felt than if we had never tried to have a modern foreign office and to do for American business what is done for our competitors by their governments."

A further amendment transfers to the new Bureau of Foreign and Domestic Commerce the duties now imposed on the Bureau of Labor, to ascertain the cost of labor, the cost of production, the profits of manufacturers, the cost of living and various similar facts formerly gathered by the Tariff Board. The amendment further provides that the new Bureau shall make such special investigation and report on particular subjects when required to do so by the President or by either House of Congress. The new Bureau is also charged with the duty of collating and publishing the tariff laws of the various countries of the world, and to furnish information to Congress and to the President relative to such laws.

From the very complete account of the past activities of the Bureau of Manufactures, prepared by the Assistant Chief of the Bureau and published in this issue of COTTON, it will be learned that even in its earlier form, the Bureau was hampered because of a lack of funds, and that it worked in close association with the Bureau of Trade Relations of the Department of State. Under its new name the Bureau will have more work, fewer sources of information, and something less than the proportionate appropriation formerly furnished to accomplish this work. This situation should be carefully studied by cotton manufacturers who would also do well to take the matter up with their Senators asking for further information and that the change be carefully considered. If finally passed, it should only be done with an appropriation attached, liberal enough to allow the broad field of the Bureau's activities to be thoroughly cultivated.

Mr. Burleson, of Texas, is fathering a bill for the purpose of furnishing the farmers of the South with statistical information concerning cotton and cotton goods on hand and in the possession of the manufacturers at given periods. While there seems to be no special objection to such a bill and it has many points in its favor, it should undoubtedly have a special appropriation attached to cover the expense of disseminating this information, particularly if this expense is to be bourne by other than the Department of Agriculture.

Congressional economy is right in both theory and fact, but executive departments should not be either crippled or abolished to facilitate the passage of vote getting, patronage making pension bills.

THE BUSINESS LEAGUE ALSO OBJECTS.

Officers of the National Business League of America have sent telegrams to Senator Francis E. Warren, chairman of the committee on appropriations of the senate, and Representative John J. Fitzgerald, chairman of the similar committee of the house of representatives, protesting against the bill reducing the appropriation for the state department. The telegrams were signed by George W. Sheldon and Austin A. Burnham, president and secretary, respectively, of the league, and read as follows:

"The National business Leagues of America deplores the action of the house of representatives in reducing the appropriation for the department of state to such an extent that it will, if concurred in by the senate, compel the abolishment of several important bureaus or divisions of the department and result in dispensing with the services of officials whose efforts have proven to be invaluable to the advancement of the industries and commerce of the United States, especially as promotive of American foreign trade.

"It goes without saying that the business men of this country will strenuously disapprove of any measure that threatens to weaken or annul the constructive executive policies of the government, as handicapping the agencies that make for larger markets in foreign fields."

GEORGIA INDUSTRIAL ASSOCIATION.

The 12th Annual Convention of the Georgia Industrial Association which comprises the cotton manufacturers of Georgia, will be held at Warm Springs Hotel, Warm Springs, Ga., on the 11th and 12th of June. Secretary Johnston reports that an exceptionally large attendance at this meeting is expected as considerable interest has been expressed from many mills heretofore not taking part in the associations proceedings. The program committee has been busily at work arranging an interesting and instructive entertainment for the attending members. Every mill in Georgia should be represented. Come on, let's go!

SOUTHERN TEXTILE ASSOCIATION.

Preparations for the Greensboro meeting of the Southern Textile Association, are progressing under direction of the program committee, assisted by W. O. Burgin, secretary of the Greensboro Chamber of Commerce, and Mr. Cone of the White Oak and Proximity Mills.

10 a. m., Saturday, June 29th, is the time set for the opening of the meeting with a brief session followed by trip to the mills.

At the suggestion of Caesar Cone the afternoon session will be held in the large hall at the White Oak Mill village, preceded by a luncheon to be served there by the management of the White Oak Mills.

At the afternoon meeting there will be papers and discussions on "The most important consideration for good spinning," by Supt. T. M. McEntire, of the Loray Mill, Gastonia. "Carding," by W. S. Dean, overseer carding in Locke Mill, Concord. "Some Phases of Welfare Work," by Bernard Cone, of Greensboro. Also a brief talk on the "Advantages derived from a visit to the Machinery Exhibit at Boston," by Supt. J. M. Davis of Newberry, S. C., and probably one or two other papers by parties to whom invitations have been extended but who have not as yet replied.

In addition to these papers the committee has the assurance of a brief paper on fancy weaving by J. J. Crosby, Asst. Supt., Pomona Mills, Greensboro, and the subject of the relations between mill superintendents and overseers and the management will be ably discussed by Caesar Cone.

In the evening there will be a smoker, with short addresses at a convenient place in the city, probably at the Court House, which is only one block from the Guilford Hotel, which will be official headquarters. Indications at present point to a large attendance. Is your mill going to be represented?

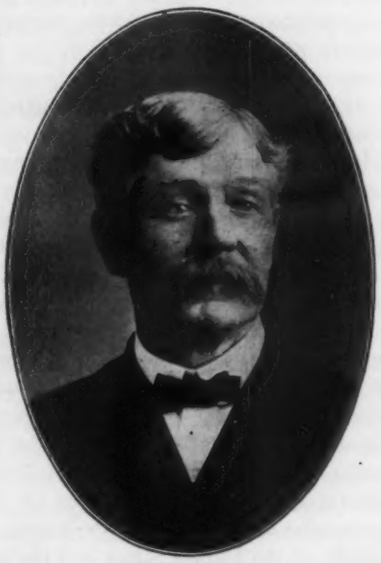
OBITUARY.

It is with much sorrow and regret that we record the death of J. W. Brown, Superintendent of The American Textile Company's cotton mills, at Atco,Ga., who died suddenly on Monday, April 29th, 1912. Mr. Brown was in his usual good health and while attending a Knights of Pythias banquet left the hall, complaining that he was too warm. While seated in his buggy, before starting for home was stricken with heart failure and died in about ten minutes.

The funeral was from his home in Atco, Tuesday afternoon April 30th, at four o'clock, Rev. L. G. Hames, pastor of the First Presbyterian church, officiating. The remains were interred at Mr. Brown's old home at West Point, Ga.

Mr. Brown was born at Paterson, N. J., 58 years ago, spending the earlier years of his life in that place. When a young man he came to West Point, Ga., and was for a number of years with the West Point Machine Works. From West Point he went to Dalton, Ga., where he superintended the Crown Cotton Mills for many years.

Mr. Brown became associated with The American Textile Company at Atco in 1904, when the mill was started and has been its superintendent from that time until his death. He was intimately associated in the management of the mill with J. A. Miller the treasurer of the American Textile Company. His loss will be felt keenly by his business associates and his many friends. He leaves a wife, four sons and two daughters.



J. W. BROWN.

The mill was closed Tuesday April 30th and Wednesday May 1st as a tribute to his memory. Mr. Brown was beloved alike by his associates in the management and the employees of the corporation. He also was prominent in mill circles in the South and had long been known as a successful manufacturer.

THANKS PROFESSOR KING.

EDITOR COTTON:

I wish to express my sincere thanks to Professor King for his kindness in undertaking to criticise my "Benign Protection" and for the courteous and fairminded manner in which he is so doing. My object in asking criticism was that I might be the better enabled to formulate what I have to say on behalf of protection in such a manner as to anticipate and answer such objections as the best informed students of the subject would be likely to make. I hope therefore the Professor will continue his good work and will not mind if I delay a direct response to his criticism until I have completed my papers. I shall endeavor to have chapter 3 ready for your next issue. With kind regards,

Sincerely yours,

(Signed) FRED W. SIMONS.

THE BUREAU OF MANUFACTURES

What it is doing for the Commercial and Industrial Interests of the United States—More Liberal Financial Support Needed and Deserved.

BY D. A. SKINNER, ASSISTANT CHIEF, BUREAU OF MANUFACTURES, DEPT. OF COMMERCE AND LABOR, WASHINGTON, D. C.

Prior to 1903 no concerted effort was made on the part of the Government to develop commerce, and what little was being done devolved upon a number of bureaus and divisions scattered throughout the different departments. This condition of affairs grew cumbersome and did not result in efficiency; consequently, the wisdom of creating a new department under one head,—the functions of which would be those of aiding and guiding the commerce and industries of the country,—was urged. Congress acceded to the wishes of the manufacturing and business interests of the country by establishing, in 1903, the Department of Commerce and Labor, to foster, promote and develop foreign and domestic commerce, the mining, manufacturing, shipping and fishing industries, the labor interests, and the transportation facilities of the United States.

The new department was made up of a number of bureaus, but it was soon realized by those interested that none of these bureaus had exactly the initiative function in regard to commerce and manufacturing that the purpose of the Department implied. Consequently, in 1905, the Bureau of Manufactures was established, for the purpose of fostering, promoting and developing the various manufacturing industries of the United States and the markets for the same at home and abroad. In this work the Bureau of Manufactures has the co-operation of all American consular officers. It also has a corps of trained experts known as commercial agents who, under the immediate direction of the Chief of the Bureau, are continually investigating trade conditions in foreign countries with regard to special lines. These agents supplement the work of consular officers who cannot be expected to make extended investigations along these lines, on account of their numerous other duties, or because of the technical phase of the investigation. Reports by these agents and consuls contain very valuable information upon which plans may be made to develop and extend the markets for the sale of our products. The Bureau of Manufactures acts as a clearing house in disseminating this information, by publishing the reports in its journal, the Daily Consular and Trade Reports, in special monographs, confidential circulars and bulletins, and tariff pamphlets.

Many of you are no doubt familiar with the Daily Consular and Trade Reports published by the bureau. This is really a newspaper, and nearly 20,000 copies are sent each day to business men in the United States. It contains reports by consular officers and commercial agents concerning trade conditions, markets for specific articles, descriptions of new inventions, announcements of expositions, opportunities for the sale of merchandise, the changes in the customs tariffs of foreign countries, and annual reviews of trade conditions in foreign countries throughout the world. In fact, it is so comprehensive and covers such a wide scope of subjects that you will constantly find within its pages articles treating of the conditions of foreign trade in all its various lines in nearly every country of the world. I would suggest that those interested not receiving these reports, should make an effort to be placed on our mailing list.

Another feature of our work is the foreign trade opportunities service. A section of the daily is devoted to the publication of short paragraphs, setting forth specific opportunities for the sale of products in foreign countries. These are transmitted by consular officers and commercial agents, who are continually on the lookout for information of this character. The names of prospective purchasers and the cities and countries in which they are located, are not published in the Daily, but are furnished to American concerns only, upon request, with the understanding that the information is to be used solely for the benefit of American trade. Up to the present time nearly 9,000 such notices have been published and the result has undoubtedly been millions of dollars of increased trade. We have on file from hundreds of firms letters stating that the following up of these trade opportunities has brought orders for their goods from all parts of the world.

Closely related to the foreign trade opportunities service, is the dissemination of information by means of confidential circulars or bulletins. Many reports from consuls and commercial agents contain valuable information which, if followed up immediately, will in many cases result in the sale of goods, or the obtaining of foreign contracts or concessions by American business firms. These are sent out to those concerns interested in the form of confidential bulletins and circulars, with the injunction that the information therein is not to be given publicity.

Frequently plans and specifications for private and public works in foreign countries are received. The Bureau promptly notifies those who may be interested, through the medium of a foreign trade opportunity or a confidential circular, advising them of the receipt of the plans and specifications and placing same at their disposal. The plans and specifications in many cases are loaned in the order of application. Sometimes, however, it is deemed advisable to forward them to trade organizations centrally located, notifying those likely to be interested of this action, in order that the documents may be inspected with the least possible delay. This information materially assists the American business man to invade new markets and, when an initial order is placed, it is generally an easy matter to hold and increase business provided the opportunity thus afforded is handled promptly and intelligently.

Still another valuable method of disseminating information is through the publication of special monographs on the trade conditions in foreign countries with respect to special products or individual countries. These monographs are compiled from the reports of consular officers, or contain the results of investigations of our own commercial agents.

The Bureau frequently requests various manufacturers

*Extracts from an address before the Proprietary Association of America.

making the same line of goods to submit to it lists of interrogatories such as, in their opinion, will elicit the information desired by them relative to the trade conditions in foreign countries with regard to the special line treated of. These interrogatories are used as a basis in requesting consular officers, of whom there are some 350, to investigate and submit reports in regard to the trade in question.

Our commercial agents are especially equipped to make investigations along their respective lines. At the present time ten of these agents are employed in gathering data with respect to the following: Machinery and machine tools; cotton textiles; chemical products; electrical machinery and supplies; leather and boots and shoes; lumber and lumber products; credit terms, and trade conditions in general. The reports of these agents are also published from time to time in monograph form.

The work of commercial agents is most important and it should be extended as rapidly as possible with a view to having commercial experts stationed in all the important commercial cities of the world, just as our foreign trade rivals have their commercial attaches detailed to such centers. They should not be hampered with duties other than those purely commercial, but given a free hand to study commercial matters and make commercial investigations. They should be men of high training and experience in their special lines, and such as would justify the Department in paying adequate salaries for their services.

Those interested can always obtain from our office on application the latest tariff rates in any part of the world on any particular product. Some thirty monographs have already been published in regard to tariffs. A number of them contain the entire tariffs of a single country, such as the customs tariff of Cuba, France, Germany, etc., while others pertain to the tariffs of all countries with respect to a specific class of commodities, for example: tariff on leather and its manufactures, machinery, machine tools, vehicles, etc. Monographs have also been published containing the laws of foreign countries governing the admission of commercial travelers and samples, and the consular regulations of foreign countries.

We now have an appropriation of only $10,000 to carry on this work. This appropriation should be increased. The work connected with foreign tariffs is most difficult and requires experts and translators of ability, and I believe we are building up a very efficient corps of these experts. Any of you who have had occasion to seek information from foreign tariff publications know how difficult it is to define intelligently many of the classifications. Especially is this true of the tariffs of South American countries. The Chief of the Division of Foreign Tariffs is now on a trip through these countries to learn more about their tariff methods. This will enable us to give to American exporters the most accurate statement of facts with regard to their application.

There are several other publications issued by the Bureau which deserve special mention. The World Trade Directory is one. It contains the names of approximately 125,000 individuals and firms located in foreign countries engaged in the import trade, or who are prepared to engage in that trade. These names are classified by countries and lines of trade.

A monograph entitled "Packing for Export" contains the statements of over three hundred consular officers relative to the views entertained by foreign importers with respect to the packing of goods imported from the United States.

The monograph entitled "Factors in Foreign Trade" contains information with respect to the currency, weights and measures of foreign countries, with conversion tables for each from foreign terms to the United States equivalents, and vice versa; price comparisons, facts in regard to postal rates, languages used, and other details continually desired by the manufacturer and merchant.

The booklet entitled "Promotion of Commerce" is another useful publication. It contains an outline of the service maintained by the Bureau of Manufactures and other bureaus and offices of the government, thus making it valuable as a ready reference for commercial firms. In it will be found a complete list of the publications issued by the Bureau of Manufactures. Those which are available for distribution may be had upon request.

In all, the Bureau has published over 150 volumes and monographs and is constantly adding to them. These, with the Daily Consular and Trade Reports, undoubtedly constitute a very valuable commercial and reference library.

The work of the Department of State, and especially that of the Bureau of Trade Relations, with regard to trade promotion is very closely related to the work performed by the Department of Commerce and Labor and the Bureau of Manufactures. In order that there may be no misunderstanding with respect to the work performed by the Bureau of Trade Relations of the State Department and the Bureau of Manufactures of the Department of Commerce and Labor, I will briefly outline the fundamental principles upon which the functions of each are based. The functions of the Bureau of Trade Relations are necessarily diplomatic and are for the purpose of arranging matters arising in connection with foreign trade relations which come within the jurisdiction of the Department of State under tariff legislation and otherwise, and in the negotiation and preparation of treaties, arrangements and agreements for the advancement of commercial and other interests. This is accomplished by obtaining through diplomatic negotiations with the governments of other countries the most favorable conditions possible under which our products may find markets in those foreign countries. The functions of the Bureau of Manufactures are constructive and promotive and are for the purpose of fostering, promoting, and developing the manufacturing interests of the country and markets for the same at home and abroad, domestic and foreign. This is accomplished by developing the foreign markets of those countries with which favorable diplomatic relations have been obtained, and through publicity and by cooperation with individual manufacturers and others interested. The work of the former bureau is therefore essentially diplomatic and confidential, while the work of the latter is giving publicity and securing the closest relations with trade organizations, manufacturers, and others interested in the development of our commerce.

We also have several independent services doing work of a similar character; for instance, the Pan-American Union, which is an international government bureau, organized to create closer relations with regard to trade conditions and otherwise between the United States and the twenty American republics to the south of us.

I have endeavored to make clear that which we are doing in the interest of export trade. We can furnish you all this information, point out the trade conditions in for-

eign markets, and the advantages of one country over the other. We cannot, however, bring these markets to you. It depends upon yourselves to occupy and hold them.

The work of developing export trade is small as compared with that which may be done in the domestic field. When it is realized that the value of our manufactured products is annually $21,000,000,000 as compared with $2,058,500,000 exported, it will be seen that the Buerau of Manufactures can render a most valuable service with respect to many subjects of interest to manufacturers and commerce in the United States. It has not been able to do so prior to this, on account of its limited equipment.

Already the Bureau is conducting an investigation into the activities of local commercial promotive organizations, such as chambers of commerce, boards of trade, and similar bodies. The time has seemed propitious to take some definite action with a view to establishing a national commercial organization which would be broadly representative of the commercial and industrial interests of the country. At the request of the commercial and industrial organizations of the United States the President, under date of March 1st, inaugurated this movement by instructing the Secretary of Commerce and Labor to take the necessary steps to initiate, as soon as practicable, at Washington, a conference of delegates from organizations which are engaged in the promotion and development of commerce and industry in their respective districts, such conference to consider the establishment of a representative national organization.

When we consider the scope of the functions of such an organization, its importance cannot be over-estimated. Such an organization could be of the greatest assistance in advising the executive branches of the government with respect to the methods and rules to be adopted in the administration of existing laws. It could be of like assistance in giving advice in regard to prospective new legislation and similar matters. It would be in the best possible position to suggest fields for new inquiries at home and abroad, the methods by which such inquiries should be pursued, and the means by which the results could be most advantageously disseminated among merchants and manufacturers. To be successful, the organization should be national in character, truly representative of all the commercial interests of the country, and deal with questions of national scope.

Congress appropriates over $15,000,000 annually for the maintenance of the Department of Agriculture, a large proportion of which is used in promoting agriculture. The yearly value of agricultural products is approximately $9,000,000,000, while the value of manufactured products is over $21,000,000,000. We have in our Bureau an appropriation of $160,000. It seems apparent that the farmer is given value received on taxes paid. Nobody questions the wisdom of supporting the Agricultural Department so liberally, for the result in the increased production of agricultural products is apparent. The farmer will continue to receive adequate assistance, for the reason that the Agricultural Department has been built up through cooperation. The closest relations are maintained between it and the agricultural stations, farmers' granges, unions, etc., and to this undoubtedly can be traced the secret of its success. Compare our appropriation of $160,000 with that of the Agricultural Department, and show me where the commercial and industrial interests of the country are receiving a fair return for the taxes paid by them. I do not believe that there is a business man in the United States who would object to paying taxes if he were assured he would receive a fair return for money so invested.

But the question remains—how are you going to get that return? The most effective method, I believe, is through cooperation and organization. I have told you what the Bureau of Manufacturers is doing in the interest of commerce. The Bureau is young and has only been developed to the point where its work can be made effective so as to result in a real benefit to the commercial and industrial interests of the country. It is the only branch of the Federal Government which develops commerce from the constructive and promotive point of view. Recently it has been rumored that the Bureau would be discontinued by act of Congress. The Department of Commerce and Labor was created to serve the commercial interests of the country much in the same way as the Agricultural Department serves the agricultural interests. The Bureau of Manufactures was created for the express purpose of fostering and promoting the manufacturing interests of the United States; consequently discontinue its work, and you deprive those interests of the services of the Bureau which has a greater possibility of affording them assistance of a constructive and promotive character than that which they receive from any other branch of the Federal Government.

I firmly believe that the work which we are doing is of the greatest value, and is vitally important to the business interests of the country and is such as to be worthy of liberal support. This, however, is not a question for us to decide. It is a question which directly affects the commerce and industries of the country, and consequently it devolves upon the business men of the United States to determine whether they will be properly represented by the Department of Commerce through a Bureau adequately equipped and liberally supported.

At a recent meeting of the executive officers of the Southern Commercial Congress it was decided to have the 1913 Annual Convention coincide with the opening of the Panama Canal. This convention of the Congress will be held in Mobile, Ala., and the Chamber of Commerce of that city in outlining plans which it would like to see carried through during the convention, has asked that the life and services of the late Senator John P. Morgan be particularly recognized. Senator Morgan for several decades was the most persistent American statesman advocating an Isthmian Canal. He died a few years after the final steps regarding the building of the Panama Canal had been taken by the United States.

The executive officers also decided that its great 1913 convention should use the completion of the Panama Canal as a means of impressing upon the nation the importance of Southern ports viewed from the standpoint of greater commerce yet to be made possible through the Canal. The commercial and historic will be blended in the celebration; for Mobile has been under five flags, French, British, Spanish, Confederate and United States and the vicinity has its place in American history dating from the year 1540, when DeSoto fought the battle of Maubila, near the river above Mobile.

IS PROTECTION BENIGN?

Does the System of Protection make the Workingman Get More or Less Goods in Return for a Given Amount of Effort Expended—Does it Bring About a more Equitable Distribution?

(Contributed Exclusively to COTTON*)*

BY WILLFORD I. KING, PROFESSOR OF POLITICAL ECONOMY AT THE UNIVERSITY OF WISCONSIN.

CHAPTER 2.

In the April issue of COTTON, Mr. Simons elaborates his argument in favor of the protective policy. He still stands squarely on the original basis of discussion when he says, "I am not approaching the subject from the standpoint of its relation to the welfare of any particular interests or classes of society, but from the standpoint of its relation to the welfare of the nation and indeed of the civilized world." He also deserves commendation for coming out for a thorough protective policy, not any of the milk and water variety of protection advocated in so many quarters today. On this point, Mr. Simons is clear and concise. He says: "The import duty that will most benefit the American people is not a duty just sufficient to enable them to compete with foreign producers, but a duty that will protect them entirely from foreign competition, thus enabling them to establish values by their own competition, which values would form the steadiest, most stable and most practical basis of exchange, and permit of uninterrupted industrial and commercial activity." This means, then, protection which really protects; a tariff policy which, if logically carried out, would make the United States a self-supporting nation, dependent on the products of no other land.

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Perhaps, Mr. Simons would except the coffee of Brazil, or the bananas of Honduras, from this general policy on the ground that these products cannot be grown in the United States. Nevertheless, such exceptions must be made with great discretion for both bananas and coffee may be produced within our boundaries. It is only a question of expense—it costs much more to produce them than to buy them. The same is true of many of our manufactured products, today carefully protected by our laws. The difference is purely one of degree, not a difference in the principle involved.

Mr. Simons still emphasizes the benefits conferred upon the laboring man as the chief merit of the protective policy. If he can really prove that the laboring man is thus benefitted, he certainly has made a most telling point in the argument, for the laboring men and their families assuredly constitute the large majority of our population. It is apparently on this contention, then, that the case for protection must stand or fall.

While in these fundamental propositions Mr. Simons is admirably clear and definite, in his general line of argument he shows a tendency toward a considerable amount of that "obfuscation" which he decries in others. This is doubtless unintentional, but it does not aid in clearing up the merits and elements of the question under discussion.

He first charges that political economists, in general, base their arguments in favor of free trade on the grounds that such a system accords with "natural law." This may have been true as regards the French Physiocrats of the eighteenth century, but these can scarcely be considered fair representatives of the great modern science of political economy. Modern economists, from the days of Adam Smith to the present time, have troubled themselves little, indeed, with doctrines of natural right. Such discussions have been left to moralists, philosophers, or politicians, and I know of no prominent economist whose arguments for freedom of trade rest upon any such hypothesis. If free trade is superior to protection it is because of its political results, not because of any philosophical theory upon which it is based.

Mr. Simons also errs in ascribing to present-day economists a belief that the law of supply and demand is similar to the law of gravitation or physics, *i. e.*, determined by the never-changing laws of nature. The time may have been when some such idea prevailed, but that phase of thought has long since passed into oblivion. While economists still accept as correct the statement that prices are determined by the interaction of supply and demand, they do not consider that this is a complete and sufficient explanation of the phenomenon of price. Supply is itself a resultant of many factors and the same is true of demand. Any complete analysis must include a study of these various components.

It is an entirely incorrect conception of the law of supply and demand and of the effects of competition to say that "the more competition there is, the lower prices will be." It is true that competition among producers tends to

lower the price, but competition among consumers just as truly tends to raise the price of any given commodity. We must not, however, infer from this statement that multiplicity of producers necessarily indicates strenuous competition. They may all succeed in combining to form a rigid price fixing monopoly, though, of course, the difficulty of combination varies directly with the numbers participating in the combination.

As I pointed out in my last article, any assumption of a general rise in values is evidently founded on fallacy, for value is a ratio of exchange and it is manifestly impossible to raise both sides of such a ratio at once. Presumably, however, Mr. Simons used the term values in the popular sense and really referred to prices. He contends that protection raises this general level of prices in the protected country, and that this general rise in prices is beneficial to the nation. Prices, in general, vary inversely with the volume of business transacted in a nation and directly with the volume of money. Any effect, than which the tariff may have on the general price level must be due to a change in the volume of business transacted. If trade is lessened, prices will rise, and this probably occurs to some extent, but the effect is, according to the best evidence, not marked.

After having asserted that protection is necessary to maintain prices in America higher than those in other nations, Mr. Simons attempts to prove that, despite this fact, protection is in no way responsible for "the high cost of living." This phrase must be more accurately defined before one can discuss it intelligently. If it is taken as meaning the general high prices of consumable commodities at the present time as compared with fifteen years ago, it must certainly be conceded that protection is not a material factor in causing the change. Neither is the poor middlemen responsible. We have had both protection and middlemen throughout the whole period in which this change has taken place. An examination of the records of the world's gold production and the per capita circulation of money in the United States during the last few years gives a sufficiently simple and satisfactory answer to all queries concerning rising prices. The chances are, therefore, that the American protective policy has been in no way responsible for the increasing cost of consumption goods in the United States.

The question of importance is whether protection has, during its entire existence, made the laborer get more or less goods in return for a given amount of effort expended. Mr. Simons asserts that protection has brought about higher price levels in this country than abroad and so has benefitted the American people and especially the American laborer. He fails to tell us how high prices prove beneficial. Though the effect of protection on the price level has probably been trivial, let us grant for the sake of argument that it has actually raised prices to a marked extent. In just what way will these high prices benefit the American people? If they get more for what they sell, they must, evidently, pay more for what they buy. In the long run, people consume their incomes, that is, they spend as much as they earn, hence the nation, *as a whole*, will neither gain nor lose by the general change in prices.

But perhaps that peculiar type of high prices, which Mr. Simons avers is brought about by protection, benefits the laboring class at the expense of the employers. To demonstrate this, it must be shown that protection causes money wages to rise to a larger degree, *relatively*, than the increase in the cost of the commodities upon which the workingman and his family live. Otherwise, the laborer certainly is not benefitted by protection. Mr. Simons contents himself with a series of platitudes about the general desirability of this somewhat mysterious variety of high prices, but he produces not a shred of evidence to show that protection affects the cost of the workingman's budget less than it does the money wages. Such assumptions would seem important enough to demand either statistical or deductive proof.

As was stated in the preceding article, the introduction of the question of value or price into a discussion of the tariff, results only in obscuring the issue and makes what is really a simple question appear difficult and complex. It was made plain that, when this idea of price was once eliminated, the fact stood forth that protection must lowet the real wage of the workingman by decreasing his productivity. Perhaps this point may be still further clarified by a different method of statement.

The economic welfare of a given nation is evidently measured by the per capita consumption of goods during the year or, to be more exact, by the per capita utility derived from the consumption of these goods. Day by day, the mills, the factories, the mines, the farms and the forests are turning out great streams of products which, sooner or later, directly or indirectly, materialize into a great flow of consumable commodities. During some season's or periods, a part of this stream may be held back in the form of capital, but this only means that a little later the current will be given added velocity. The only ways in which the economic welfare of the inhabitants can be increased are by increasing the size of this stream, or by increasing the utility derived from the different drops composing the river, that is, the individual articles which are consumed. The total utility might be enhanced by a better system of distribution of income; by giving more to the poor and less to the rich; for a given unit of almost any article satisfies more intense wants when used by the pauper than when consumed by the plutocrat. Does protection bring about a more equitable distribution? Do the millions which Andrew Carnegie says were placed in his pocket by the steel tariff indicate that the poor have gained at the expense of the rich? Did Henry Havemeyer, who called the tariff "the mother of trusts," illustrate by his multiplied millions any marked tendency toward more equal distribution brought about by the tariff on refined sugar? Rare indeed is the advocate of a protective tariff who is so ardent in its support or defense as to assert that the workingman has gained at the expense of the entrepreneur.* If Mr. Simons so contends, I must certainly ask him to produce statistical evidence to reinforce his opinion.

If, then, protection does not bring about a more equitable distribution of this great stream of social income from which laborer and capitalist, landlord and tenant, pauper and merchant prince must all alike draw their sustenance, only two ways remain in which the economic welfare of the nation may be improved. First, the tastes of the people may be cultivated so that the same commodities give keener enjoyment than heretofore. Second, the flow of the stream

*Entrepreneur. One who creates a product on his own account; whoever undertakes on his own account an industrial enterprise in which workmen are employed.—Ed.

may be increased. There seems to be no possible way in which protection can affect the appreciative ability of the people. This, then, being ruled out, it only remains for us to inquire as to how this tariff policy affects the flow of this river of social income.

The size and velocity of this stream depend upon the fertility of the soil, the abundance of the natural resources, the industry and efficiency of the population and their tendency to save and accumulate those stores of capital so necessary to the production of wealth and income. Were we surrounded by an impassable Chinese wall or an impenetrable tariff barrier such as Mr. Simons proposes, this productiveness of the nation would finally and conclusively determine the quantity of income received. But, under existing circumstances, nations differ in their characteristics of soil, of climate, and of population. The rubber forests thrive well in the valley of the Amazon, but not on the prairies of Nebraska. The plains of Australia are finely adapted to growing wool or mutton, but they cannot compete with Iowa in producing corn and hogs. The result is that, from times immemorial, nations have found it to their mutual advantage to exchange those articles, to the production of which their soil and climate is especially adapted, for those other commodities which are more easily grown or manufactured in foreign lands. This trade does not mean gain for one and loss for the other, but mutual advantage to both. If either loses by the transaction, the trade quickly stops. If trade is beneficial, no bounty is needed to stimulate it; if it is harmful, no tariff is necessary to cause it to cease.

The very fact, however, that exchange of goods proved to be such a source of mutual gain gave rise at an early date to efforts on the parts of the sovereigns or feudal barons to secure for themselves part of this rich profit. Thus, a system of taxing trade came about, and it was found to be such a reliable source of revenue that its application became well-nigh universal with the result that people began to believe these taxes a sort of natural institution and, because of this extreme commonness, they received the name of *custom* duties. But it was only after long centuries of this form of taxation, that anyone had the temerity to come forward with the arguments that the payment of these taxes was beneficial to the tax payers themselves. This, however, proved such a comfortable theory from the point of view of the governments and other special beneficiaries of the tariffs, and it was so persistently drilled into the minds of the populace that it became an almost generally accepted belief. Thus, has protection grown and flourished.

Nations must have revenue and there may be reason in asserting that the tariff is as equitable a system of distributing the tax burden as any other. Great exotic industries have been made to flourish in unfavorable climes and locations because sheltered by the wind-break of protection, and it may be true that more damage would be caused by a sudden removal of these walls than would ensue by allowing them to remain for the time being until readjustments to normal conditions could be brought about. The national welfare may require that the essential supplies necessary for war be produced within our borders regardless of the costly burden imposed upon the people. We build great battleships and justify our action by this same argument. There may have been a time when some straggling infant industry needed the kindly nurture of a paternal government in order to rear it to a man's estate. Thus, we cannot contend that protection is under no circumstances justifiable, but the point that seems clear is that it is only justifiable in those cases in which its cost is outweighed by its benefits. The protectionist must bear the burden of proving that each specific schedule adopted is justifiable despite its deleterious effects in lowering real wages and preventing the gains which might be made by profitable exchanges. America is rich because of its great natural resources and its enterprising, thrifty and industrious inhabitants and in spite of its ill-managed tariff policy.

Mr. Simons indeed proves himself a most chivalrous defender of the waning cause of protection when he advocates such a thorough-going policy as would drive every merchant-vessel from the seas, banish from our marts every product of a foreign land, and re-convert our system of world-trade and world-industry into the isolated provincial economy prevalent in the days antedating the compass or the sextant. Nevertheless, this is certainly the rational outcome of the doctrine of protection when rigorously carried to its logical conclusion. Let us hope that all protectionists in the future will act with a like degree of consistency.

Senator Duncan U. Fletcher, of Florida, president of the Southern Commercial Congress, recently appointed a committee of representative men of the South to consider the problem of breaking up large plantations of the South into small holdings. This committee includes L. C. Irvine, Mobile, Ala., chairman; Col. Harvie Jordan, Atlanta, Ga.; T. F. Peck, State commissioner of Agriculture, Nashville, Tenn.; E. J. Watson, Commissioner of Agriculture of South Carolina, Columbia, S. C., and Geo. W. Deen, Waycross, Ga.

At the fourth convention of the Southern Commercial Congress, at Nashville, Tenn., in April, the following resolution was unanimously adopted by the Congress:

Whereas, the ratio of effective citizenship to population in the South is but little over one third that of the agricultural states of the West, and,

Whereas, the only hope of agricultural up-lift in the South lies in the fundamental solution of this difficulty by the creation of a soil tilling, farm-owning white population, sufficient to render this ineffective population a negligible quanity, and,

Whereas, the large plantation system is an absolute bar to individual small farm ownership,

Therefore be is resolved that this Congress heartily commends to the people and their legislatures serious consideration of this question, and immediate and effective steps to break up large plantation holdings, and to this end we suggest to the Board of Directors the appointment of a permanent committee on this subject.

Senator Fletcher's appointments are to carry out, if possible, the instructions in the resolution.

It is a well known fact that combustible materials should be kept carefully away from contact with incandescent lamp bulbs. Neglect of this precaution caused an evening fire recently in the cloth room of the Granby Cotton Mills, damaging the selvage on about 160 pieces of cloth. The fire was put out by one Grimmell automatic sprinkler head with very slight damage aside from the spoiling of the cloth in process of manufacture.

National Association of Hosiery and Underwear Manufacturers.

The eighth annual convention of the National Association of Hosiery and Underwear Manufacturers was formerly opened on Tuesday morning May 7th at the convention hall in the First Regiment Armory, Broad and Callowhill Streets, Philadelphia, by President Garnett Andrews who, with a few introductory remarks introduced the Hon. Rudolph Blankenburg, the Mayor of Philadelphia, who delivered the address of welcome. It was voted to dispense with the reading of the minutes of the 1911 convention. C. B. Carter then read the report of the secretary and treasurer and the assistant treasurer, Robert C. Blood, also read his report on the finances of the association.

Fred W. Simons then outlined the purpose and accomplishments of the recent National Commercial Congress at Washington, which he attended with Secretary Carter as a delegate from the association, W. Park Moore moved that the association join the National Chamber of Commerce, explaining that the cost would not exceed $250. An informal report of the tariff committee was given by President Andrews, and the report of the executive committee was read by Secretary Carter.

The first formal paper on the program was an address on lighting by R. S. Iremonger of the General Electric Co. He was followed by Charles Vesin, who explained that while the original subject of his address was to have been the relation of the manufacturers to the selling agent, he had on second thought took the liberty of changing this subject and therefore he spoke upon the "Relation of The High Cost of Living to the Hosiery Manufacturer." The committee on resolutions, nominations, and press, were then appointed by President Andrews and the first session adjourned.

The afternoon was devoted to visiting the exhibition and to the various meetings of sub-associations as announced in the formal program last month.

The second days session of the convention was called to order by President Andrews with a much better attendance than at the earlier session. The address by the Hon. J. Hampton Moore, Congressman from the third district of Pennsylvania, had to be dispensed with because of official duties requiring Mr. Moore's attention elsewhere. The first formal paper on the program was read by W. W. Smith of the estate of Thomas Johnson on "The Use and Abuse of Special Packing." Immediately after this address the following resolution was presented by the resolution committee:

"Resolved, That in view of the well known abuses having their origin in the present system of special banding and labeling, that members of this association compel jobbers to supply their own bands and labels for all special packing." This resolution was passed unanimously.

The next speaker on the program was Stanley R. Latshaw, of Curtis Publishing Co., who spoke on the subject of "Modern Methods of Merchandizing." This was followed by a paper entitled "A Forward Step in Scientific Shaft Adjustment and its Results," by George W. Loggie of the Kinkead Mfg. Co. The nominating committee then rendered its report and the following officers were elected for the ensuing year by a unanimous vote:

President Charles E. Leippe, Reading, Pa.

First Vice-President Edward Blood, Sr., of Philadelphia.

Second Vice-President, T. H. Johnston, of Knoxville, Tenn.

Secretary, C. B. Carter, Philadelphia.

Treasurer Robert C. Blood, Philadelphia.

The following directors were then appointed for a period of two years: W. Park Moore, Philadelphia; D. L. Galbraith, Bay City, Mich.; and S. D. Bausher, of Hamburg, Pa.

Charles E. Leippe, the new president was then escorted to the chair and in a brief address requested the co-operation and support of all the members during the ensuing year, and also thanked the association for the honor they had conferred upon him. The session then adjourned.

CHARLES E. LEIPPE, THE NEWLY ELECTED PRESIDENT.

The Thursday morning session of the convention was called to order by the newly elected president at 10:30 o'clock, and although there were not so many members present as on the preceeding day, still the active members of the association were well represented. The first address of the day was entitled "The Basic Quality of Silk and its True Value," by H. F. Hofer, of Paterson, N. J. The chairman of the Resolution Committee then read the following resolutions which were all formerly adopted by the association:

"Whereas, We believe that the business interests of the National Association of Hosiery & Underwear Manufacturers, the National Wholesale Dry Goods Association and Knit Goods Buyers Association are mutual, and that all these associations should work in harmony; therefore, be it

"Resolved, That we hereby express our friendly feeling for these kindred associations, and extend to them as associations and to the several members of these associations an invitation to be our guests at the banquet and vaudeville-

smoker to be given during the next annual convention of the National Association of Hosiery & Underwear Manufacturers.

"Whereas, So many of our members have found the purchase of cotton yarns upon the net weight basis of so great advantage over the old method of buying upon the 2 per cent. allowance basis, and the number of knitting manufacturers who demand and receive net weight terms and allied interests; then, be it

"Resolved, That we impress upon all members who are not now buying yarns on the net weight basis to adopt this plan, and as a means of impressing upon them the importance of these terms we recommend that they adopt the system prepared by the association of keeping accurate yarn records.

EDWARD BLOOD, SR., FIRST VICE-PRESIDENT.

"Whereas, The continued operation of the credit bureau department of the National Association of Hosiery & Underwear Manufacturers has more fully demonstrated the efficiency of this system for the mutual protection and advantage of the members of our association; be it

"Resolved, That we commend very highly the methods pursued in securing the results that have been achieved, and that the secretary be instructed to make every possible effort to enlist the cooperation and support, not only of all members who have not joined in this work, but also endeavor to secure the memberships of all knitting manufacturers not now members of the association.

"The National Association of Hosiery and Underwear Manufacturers, in convention assembled, celebrating their eighth annual convention and exhibition, wishes to call to your notice the wonderful growth it has made since its inception. Starting with 42 charter members, we now have a membership of nearly 500. The exhibition features displayed here in the First Regiment Armory speak for themselves, and we believe are a practical demonstration of the great value of this association to the knitting manufacturers and allied interests; therefore, be it

"Resolved, That we urge upon each and every member of the knitting industry to unite with us and assist in pushing forward to a full and complete growth the National Association of Hosiery and Underwear Manufacturers."

"We recommend that Sections 1, 2 and 3 of Article IV be changed to read as follows:

Section 1. The officers of the association shall consist of a president, two vice-presidents, secretary, treasurer and a board of directors. The president and vice-presidents shall be ex officio members of the board of directors and all shall serve without compensation except the secretary and the treasurer, the amount of whose compensation and bond shall be fixed by the board of directors.

"Section 2. The president, the two vice-presidents, secretary and treasurer shall be elected at each annual meeting of the association, and shall hold office for the term of one year, or until their successors are elected and qualified.

"Section 3. The secretary shall receive instructions from the board of directors and need not of necessity be a member of the association.

"We also recommend that the following be added to the by-laws:

"Section 2, Article VIII. The treasurer shall be a member of the association and have charge of all funds due to the association collected by the secretary or received direct. He shall approve all vouchers and countersign all checks subject to instructions of the president."

THE SOCIAL FEATURES.

On Wednesday evening the members of the association and their friends gathered in the Scottish Rite Hall on Broad street for the annual smoker and vaudeville. This function has become a permanent feature of the annual conventions. Arriving at the hall the members received steins, and also cigars, pipes and tobacco. It was announced by those who gave out these souvenirs that all who desired to partake of the beverages which were to be served should not fail to take one of the necessary steins, and these same attendants later stated that not a single member missed his chance—all of which speaks well for the social spirit in the association. An informal appearance was obtained within

C. B. CARTER, SECRETARY.

the hall by having the tables arranged irregularly, and the members sat around these to talk, smoke and—otherwise enjoy themselves.

Just prior to the starting of the regular performance W. W. Smith, of the Estate of Thomas Johnson, announced that Mr. Simons would have something to say, whereupon the latter stepped to the stage with a large and handsome loving cup, which he presented, on behalf of the association to Retiring President Andrews. Mr. Andrews in a speech of acceptance expressed his appreciation of the loyal support given him and of the many friendships he had formed during his two years' administration. The vaudeville show was most enjoyable. Between each act all joined in singing popular airs which were printed on the program. Beer was served continuously by a corps of waiters and there was an intermission during which refreshments were brought in. All who attended were enthusiastic over the success of the affair.

Mill Conditions and Market Reviews.

SOUTHERN MILL SITUATION.

(*Special Correspondence.*)

A great deal of activity is now being experienced on coarse yarns, the market for this class being much more alive than has been the case for a number of years. Fine yarns are practically at a standstill, with very little demand, and practically no fluctuation in the prices; and as the greater part of the equipment of the South is on the coarse, rather than the fine yarns, the mills of the South are now in prime condition.

The present condition of the trade is working more to the advantage of this section than to any other, and the manufacturers here are taking the benefit. Mills are being run to produce the greatest quantity possible and even at this rate the orders continue to come in such quantities that it is practically impossible to fill them. Many have resorted to night work in order to fill the orders that are already on their books, but are yet sold up for a good period ahead.

Prices are still in the hands of the manufacturers, though the jobbers are holding off as much as possible, beleiving that it will not be possible for the spinners to hold up the prices much longer. Cotton has been fluctuating somewhat with a tendency downward, but textiles have yet to attain the top prices in proportion to the rise in cotton staple that they experienced some time ago when cotton went to 12 cents; at this time there was practically no increase in the prices of textiles, and there has been no appreciable increase since. The prices now obtaining might be said to be permanent for some time yet, as the manufacturers are not going to decrease their prices when there is a ready market for their goods at present levels.

The system many mills have adopted of going into a night schedule, in order to increase the production of their mill, has caused a serious condition among the Southern operators. Many mills are now unable to run their entire mills because it is impossible to get the operatives with which to run. This might be accounted for because the pay at night is better and there are fewer hours per week; but the condition stands as stated and presents a serious aspect to the Southern manufacturer.

There have been several strikes among the operatives within the last few weeks, and it has caused some stir as there has been some talk, since the strikes in the New England states that the I. W. W. was coming South to organize. Of the three strikes organized here, very little of the organization is known; they were practically all weavers, and in each case went back to work within a day or two, and without getting the increased pay for which they struck. These troubles occurred at Clifton, S. C., Spartanburg, S. C., and at Clearwater, S. C.

In mill building, the past month did not compare with the previous month in the amount of new machinery placed, yet on a whole there has been a great deal of activity in mill building and additions. Capital seems determined to grasp the opportunity while it is here this time and get what there can be gotten out of cotton manufacturing; from no other section of the United States do we hear of as great activity as from this section.

There have been several new projects, that is, entirely new mills planned: The King Cotton Mill Corporation, of Richmond, Va., has been granted a charter with a capital of $100,000, no particulars known; the Durham Hosiery Mill Co. has decided on building an entirely new mill at Durham, N. C. at a cost of $100,000, thus making the sixth mill owned and operated by this company in North Carolina; D. Y. Cooper, of Henderson, N. C., announces that he is planning and will build a new mill to cost $100,000, which will make the third mill at that place under the management of Mr. Cooper; the Avondale Mill Co., of Birmingham, Ala., announces that a $500,000 mill will be built by that company at or near Birmingham, though same will be under different management; the Kershaw Cotton Mills have been incorporated at $125,000 to build a mill at that place in South Carolina; the Southern Aseptic Cotton Co., of Chattanooga, Tenn., has been incorporated at $25,000 to build a mill to manufacture absorbent cotton gauze.

Those mills which have made announcement of additions that have been decided on are as follows: Minneola Mills, Gibsonville, N. C., a small addition to dye and finishing house. Fairmont, S. C., Mills will add 140 dobby heads, contract placed; Camperdown Mills, Greenville, S. C., a brick addition to the dye house; Dan River Mills, Danville, Va., have placed contract for 10,000 spindles and 800 looms, for the new addition announced last month; Champion Fibre Co., Canton, N. C., will build an electro-chemical plant, for water purification; Richmond Hosiery Mill, Rossville, Ga., an electric power plant will take place of former power; Union Buffalo Mills, Union, S. C., will reorganize power plant, and build addition to boiler house; Proximity Mfg. Co., have placed contract for 100 looms for the White Oak Mills at Greensboro, N. C.; Mayo Mills, Mayodan, N. C., will build an hydro-electric plant; Wilson, N. C., Cotton Mills will add more machinery, in form of twisters, roving machinery, pickers, cards, etc. to the amount of $25,000. American Net & Twine Co., Anniston, Ala., have let the contract for an additional warehouse; Milstead, Ga., Mills will increase equipment by adding 612

spindles, 10 looms, 12 cards, and complementary machinery; Brookside Mills, Knoxville, Tenn., will add 200 looms at a cost of about $75,000; Highland City Mills, at Talladega, Ala., have placed contract for winders at cost of $7,000; The Durham Hosiery Mills, are expending $17,000 on the plant at Chapel Hill, N. C., increasing size of plant and adding an engine; Walhalla, S. C. Mills, adding two warpers and a stamping machine; Prattville, Ala., Mills are building a warehouse and planning other additions; Cowikee Mills, Eufaula, Ala., are adding 8,000 spindles, the contract having been placed; Ledbetter Mfg. Co., Rockingham, N. C., have awarded contract for 2,500 spindles to be placed in the new building announced last month; Pee Dee Mfg. Co., Rockingham, N. C., are reported to be adding 5,000 spindles with complementary machinery, and will also probably add looms; Bradford Knitting Mills, Statesville, N. C., have added new machinery; Monarch Mills, Dallas, N. C., have placed contract for 2,000 spindles; Exposition Mills, Atlanta, Ga., are doing considerable addition and improvements, and have placed contract for 16,000 spindles and complementary machinery; Shawmut, Ala., Mills, branch of the West Point Mfg. Co., are adding 5,000 spindles, 38 looms and other machinery, the contract for same having been awarded; Ware Shoals, S. C., Mfg. Co., has opened bids for a three-story modern mill building; Newnan (Ga.) Cotton Mills, have added 15,000 spindles; Hetrick Hosiery Co., Walhalla, S. C., have given contract for the construction of an addition to the present plant, which will be equipped with new machinery; Fidelity Hosiery Mills, Newton, N. C., are building new mill to take place of the old one; Stonewall (Miss.) Cotton Mills are building finishing room for colored goods; American Hosiery Mills, Kernersville, N. C., which was destroyed by fire, will rebuild at a cost of $25,000 and the Cleghorn Mills, Rutherfordton, N. C., are building a small addition to present plant; Coosa Mfg. Co., will build a converting plant near Chattanooga, Tenn. at a cost of about $60,000.

Reorganizations: The Tevora Mills, Yorkville, S. C., have been incorporated at $40,000; this mill was formerly Tavora Mills. Louis Mfg. Co., of Concord, N. C., formerly the Roberta Mfg. Co., has been granted a charter with a capital of $75,000. Control of the Liberty (S. C.) Cotton Mills has been purchased by J. W. Greer, of Easley, S. C., for $90,000. Buffalo Mfg. Co., Stubbs, N. C., has been incorporated with a paid in capital of $30,000. Southern Cotton Mills, Hawkinsville, Ga., has been sold for $50,000. Notices have been sent to the stockholders of the following mills to meet for the purpose of considering liquidating the present company. Seneca, Capital City, Richland, Olympia, Granby, Wylie, Walhalla, Pine Creek, Beaver Dam, Victor, and Fairfield; the meetings of the first six have been held and it was decided to liquidate; these mills are a part of the Parker Mill Co., and this matter is only one of form.

The Walterboro Mills, have resumed operation after several year's idleness. Alta Vista (Va.) Cotton Mills started operation on May 4th. Panola Mills, Greenwood, S. C., started operation on May 22.

Propositions under consideration: Meritas Mills, Columbus, Ga., are considering enlarging building for increased equipment. Monagan Mills will hold stockholders meeting June 18 to consider increasing capital stock from $1,050,000 to not over $4,000,000. Carolina Mills, Greenville, S. C., will hold stockholders meeting to consider increased equipment. Monaghan Mills will hold stockholders C.) Mills are considering forming another company to develop water-power resources at their plant. Chiquola Mills, Honea Path, S. C., are considering increase of capitalization to $716,000. Marlboro Mills, McColl, S. C., expect to add new machinery. National Assn. Garment Mfgrs., may build a thread mill at St. Louis, Mo. Union Mills, LaFayette, Ga., expect to change over about 300 looms, adding new looms of modern construction.

A large number of mills have held their stockholders meetings this month and the conditions have been found in excellent shape. Practically every mill is now paying a good dividend.

NEW ENGLAND MILL SITUATION.

(*Special Correspondence.*)

At the end of May the mills not engaged on fine goods are running as much machinery as they can supply operatives for, and the prospect seems good that the summer will be an active one. The markets have been generally quiet with firmness well maintained on many of the leading staples. Where there has been weakness it has been due either to exceedingly close competition for business as in the case of plain fine combed yarn cloths, or in the print cloth numbers that were advanced unduly in April. Outside of the fine goods of a plain character, accumulations have not amounted to anything and they are offset by further additions to orders for goods to be made for fall delivery.

The conditions in fine cloths are susceptible of an explanation that will account for the unusual hesitation in this division of trade. Fashion still operates to restrict the yardage of dress cottons required, and the weather has been so backward that spring distribution at retail was greatly hampered. It is also apparent that the great additions to fine spindles in the past five years have not been followed by the creation of new markets in a proportion that will care for the added output and the adjustment along this line must necessarily depend more or less on a broadening of the purchasing power of the people, and the introduction of new styles of fabrics that will prove attractive. New Bedford mills are not operating more than 80 to 85 per cent of the machinery and Fall River fine goods mills are running light, curtailing in all about 50,000 pieces a week.

Print cloth stocks are substantially what they were at Fall River a month ago, about 700,000 pieces of all kinds, and this is noteworthy as showing that after a month of light sales mills were unable to accumulate in advance of the demand. Prices fell off from a top of 5 3-16 cents for 38 1-2 inch 64 x 64s to 5 1-16 cents, and from 3 5-8 cents for 27 inch 64 x 60s to 3 9-16 cents. Taken in conjunction with the fact that the sales for the month hardly reached a single week's full output, it would seem as if the market is very solidly based for the trade of the summer months.

There has been some improvement in the labor situation in New England but there is still a great deal of mistrust expressed, lest the radicalism of the time may bring about further sporadic strikes. One of the most annoying things encountered by the mills is the indifference of operatives to accept the work offered even when higher wages are paid than have prevailed for years. It is fully expected by the mill men that operatives will insist upon taking vacations

during the summer months despite the fact that many of them have not been working steadily for the past two years. A very considerable difficulty is found in securing skilled help for many of the fancy goods that are being put into the looms.

Bleached cottons have held very steady and there are still many unfilled orders on the books for some of the best known branded lines. The jobbers have not been buying so freely of late but they have accumulated no goods to speak of for the fall trade. The bleacheries have been very busy on goods for quick delivery and have not built up much new business for delivery beyond July.

The action of the Amoskeag Manufacturing Company in confirming all "at value" orders for staple ginghams at 6¼ cents and again placing the goods "at value" was accepted in the market as expressing doubt as to the volume of goods the trade would take at the higher figure talked of in April. It is quite probable that the light business done this season on dress ginghams as compared with other recent years accounts for the unexpected move. Gingham production has been greatly restricted this year by the strikes in the Everett and Lancaster mills, but buyers have not been impressed, because they have not felt the usual call for this merchandise from the counters.

The opening of 32-inch shirting chambrays at 6½ cents for the new fall season was followed by a great rush of business. The price was the same as last year and the cloth at that figure was the most available fabric cutters could have in their stocks for shirts, dresses, and rompers. Some of the Southern lines were neglected until the large Eastern producers filled up their order books, but at the end of the month there were signs that there would be plenty of business to go around. The cutting trades have generally been more consistent buyers than the jobbers all this year. There has been a very steady demand for seersucker crinkles and plain seersuckers and this has given the gingham mills business in volume to take the place of that lost by the quiet in dress ginghams.

Staple prints and percale have been steady but not active. Shipments for export continue large and the printers have been working full time and with a full complement of hands. Deliveries on many of the light ground percales have not been as full as cutters have been calling for and there is no accumulation of stocks in staple indigoes, reds, or grays. At the end of the month jobbers were taking advantage of fall dating in sending in blanket orders for prints, the selections to be made later on. The price of 5¼ cents for staples is about ¼ cent a yard below the parity of gray cloths and buyers are expecting an advance before many weeks.

The Atlantic sheets and pillow cases, a new line brought out by the Atlantic mills of Lawrence, have found a good place in the market, and lines like Pequots, Pepperells, and Fruits, are well sold ahead. Pillow tubings are in especially good shape.

The duplicate demand for blankets, canton flannels, flannellettes, mottled flannels, and printed flannellettes, has been coming forward earlier and in much larger volume than last year. Such mills as the Nashua and Amoskeag can give no additional deliveries on several lines of napped goods earlier than October 1 and many of the leading branded lines are virtually out of the market in so far as new deliveries go this year. It is fully expected in the trade that when August arrives there will be a distinct shortage in the market of many of the staple lines.

Denims, cheviots, and colored duck have ruled very steady and the manufacturing trades have been calling for additional goods for late summer and early fall shipment. Prices on these goods have been held firm without difficulty owing to the well sold position of the largest producers.

Quilts have been sold into October by two of the largest mills and the Bates lines have been advanced. The Monument and Stevens mills have been making large shipments all through the spring months and the output is bespoken for some time to come. Fancy towellings, diaperings, and similar merchandise is scarce for quick shipment and jobbers are anxious to get more of the goods in hand that they have on order. Most of the selling agents are anticipating an active call from the jobbing trades soon after the June cotton report comes to hand.

There is a marked tendency in the fine goods markets to feature heavier cloths than have been turned out by the mills in the past few years. Many of the new corded goods are being offered on nainsook and cambric grounds, while poplin, rep, and pique weights are sought after by the cutting trades steadily for skirt and suit purposes. The ratines that came into the markets this year were not well regarded when first shown but they are now selling well, and modifications of these cloths are being made in sample lines for the coming season. Novelty coarse yarn cloths are wanted and the mills are making a wide variety of them in sample pieces. Fine crepes, modifications of silk striped poplins, and voiles, are all being ordered.

The shirting trade has been considerably disturbed by the higher prices mills have been forced to ask for duplicate orders. The sample lines were prepared and priced before the wage advances and before the radical uplift took place in staple cotton and other materials entering into costs. To duplicate at the initial prices would mean serious loss for the mills and rather than take a loss in operation many manufacturers have passed business.

Dyers and finishers have been busier on fancy cloth than on the staples and they are anticipating an extension of this business for the new season. They may possibly have a quiet few weeks in the early summer but many of them anticipate a very active fall. The fancy job printers, such as the Arnold Works, are very busy and have very large orders ahead on specialties. They could handle a great deal more if the staple lawns and batistes were selling.

The larger machinery shops are now running full time and they are adding steadily to their complement of workers. The orders they are getting are from established corporations principally but some new concerns are underway. They are troubled somewhat by the possible revision of the metal schedules in Congress but they are so much better conditioned for business than they were a year ago that they incline to take the tariff agitation philosophically.

THE KNIT GOODS MARKET.

The knit goods market for the past month has been one in which considerable business has been done although there seemed to be an inclination to wait for better weather conditions. Toward the latter part of the month the weather warmed up considerably and business picked up accordingly. The principal event of interest to knitters during the month was the Eighth Annual Convention of the National Associa-

tion of Hosiery and Underwear Manufacturers at Philadelphia together with the exhibition in connection therewith. This was largely attended by those interested and in spite of inclement weather conditions everyone had a good time and no doubt largely profited by their visit. The opening of the month showed prices advancing on all lines of cotton hosiery for spring and summer with an exceptionally strong market for goods for early delivery. Trouble began to be encountered almost immediately in the getting of suitable deliveries to suit the buyers. The underwear market continued moderately quiet because of the cold weather during that period. There was considerable demand however for quick delivery in underwear and a decided scarcity of cheap balbriggans.

As the month progressed the underwear situation took on a better tone with the improvement in weather conditions, and light weights in all instances were very strong where quick deliveries were wanted. Quite a few of the buyers began to figure on fall goods because the present results with their spring deliveries were teaching them a lesson in regard to what they might expect in the fall. Duplicate orders on ribbed goods for fall delivery were being received in good quantities and underwear manufacturers seemed to have no definite idea at this time in regard to the opening of next spring's goods. The better lines of hosiery were improving and fine gauge cotton goods were selling well. The demand for white and tan continued without slacking and the shortage of white predicted sometime ago will probably materialize very soon.

The shortage in the hosiery market made it a particularly strong sellers' market during this period and caused considerable anxiety for future orders. Considerable interest was expressed on the date that will probably be set for the opening but at this time no date had been decided upon. In the underwear market nearly all the desirable lines of underwear were sold up and while the absence of warm weather continued to be somewhat of a handicap, the short age in some lines easily made up for this feature of the situation. Prices at the next opening was the main subject for discussion. All sorts of rumors were going around in regard to the steps taken by some factors toward the new seasons goods, but none of them were officially confirmed. Tan hosiery in both men's and women's goods continued a strong seller and good silk lines continued in demand. The call for cheap silk hosiery seems to be gradually diminishing and will no doubt drop out of sight entirely a little later.

As the month closes the underwear trade seems particularly worked up due to the nearness of the opening for spring 1913 although no date has been set up to the present. As indicated in an earlier report it is evident that many of the knit goods factors are trying to influence the setting of an opening date and to hold it up until later if possible. However there are always some members who believe that by producing their samples for an early date they stand in hand to secure a greater proportionate amount of orders. While the hosiery trade has not as yet exhibited the same degree of interest as has the underwear trade in regard to the coming opening, there is a good deal of discussion going on pro and con concerning the probable outcome. There seems to be a fair amount of duplicate business for fall coming in and quite a brisk business for spot delivery. Taken all in all the situation in both markets is a very satisfactory one and considering the fact that 1912 is a presidential year, the conditions seem to be as a whole very gratifying.

MONTHLY REVIEW OF THE COTTON MARKET.

(Contributed Exclusively to COTTON)

BY H. AND B. BEER, NEW ORLEANS.

There has been a change for the better in weather conditions during the past month, the recent rains having given way to favorable dry, warmer weather. As a result there has been a marked improvement in crop accounts compared with the outlook one month ago, especially in the backward sections of the central and eastern portions of the cotton region. Planting is now nearing completion in all sections of the belt, upland planting having been finished, attention is now being directed to planting of the low lands.

The flood in the Mississippi Valley is gradually passing into the Gulf, and while much land is still under water, planting is about to start, as the water will soon disappear from the plantations, having run off much of the land already. Government agricultural agents are advising shallow plowing and planting in the flooded districts, and the use of early maturing seed in order to force the crop to an early maturity.

The modern method of cultivation in the more favored districts of the east and west is also being advocated by state and federal field agents. Instead of putting to use all of the fertilizer at planting time, as has been the case in the past, thereby running the chances of losing the greater portion of the fertilizer in event of washing rains, only a portion of the fertilizer is advised to be used at the start, a portion during the growing season and a portion at the maturing stage of the plant. In this way the crop will obtain all the benefit to come of the use of the plant food. Big results were obtained last year in the South Atlantic states as a result of this method of cultivating, and much is expected of the same method this year, as it will be on a larger scale.

Owing to the more favorable weather and crop developments the market has experienced something of a decline, prices having lost about 40 points, or about $2 per bale compared with one month ago, and if the weather remains favorable, chances are, although occasional rallies are to be looked for, that the market will gradually work lower because a crop of 14,000,000 bales of American, plus about 5,000,000 Indian and Egyptian, will be more than sufficient to meet the world's requirements considering the large visible and invisible supply to be carried over at the close of this season, perhaps more than 4,000,000 bales.

It has come to pass that last year's gigantic crop was partly due to the acreage having been 1,677, 000 acres larger than originally figured on, the revised acreage figures issued by the government this month showing the acreage of 1911 to have been 36,681,000 acres instead of last December's estimate of 35,004,000 acres, 36,045,000 acres of which were picked. From present indications it would seem that there will be no great reduction in the acreage this year, probably not more than about five per cent, which would still leave about 35,000,000 acres on which to grow a crop this year. The yield per acre last season was 207.7 pounds. Therefore, it would not be a very difficult task to make more

than 14,000,000 bales this year, since last year's yield turned out to be about 16,250,000 bales.

Thus far this season there has been marketed of last year's crop 14,922,000 bales, against 11,381,000 one year ago, and as this year's crop will probably be about 16,250,000 bales compared with last season's yield of 12,120,000 bales, the South has yet to market about 1,328,000 bales, whereas last year only 739,000 bales were marketed after this date. This is a significant feature to be considered by the manufacturer because of the world's visible supply being of record breaking proportions 4,482,000 bales against 3,228,000 last year, particularly on the eve of marketing a new crop, more especially since the spinners of the world have already taken 12,397,000 bales of American vs. only 10,117,000 to even date last year. In other words there has already been more cotton marketed of American growth than the world will consume this season by about 900,000 bales. To put it plain last year's crop will exceed consumption by about 2,250,000 bales.

THE YARN MARKET.

The yarn market for the month has been rather quiet although there has been practically no losses from the high position attained at the close of last month. The uncertainty in the price of the raw material and its fluctuations up and down from day to day has no doubt contributed largely to the speculative features of the market. Buyers are purchasing only what is absolutely necessary because they feel with each fluctuation that perhaps the next one will be a drop in their favor. However, dispite the fluctuating raw material price, the yarn prices were held in a fairly firm fashion and very little changes have been noticed. Early in the month many spot yarns were demanded, spinners were holding firm and many advancing quotations. There was however little tendency to buy ahead on the quotations then prevailing. This produced a rather spotty market and while the knitters demanded quick delivery and were as a rule comparatively busy and many of them very busy the weavers continued the policy of purchasing on a hand to mouth basis. There was very little stocked yarn around the market at this period and this of course was a circumstance entirely in favor of the spinner.

As the month advanced the cotton yarn market continued strong with, if anything, an advancing tendency. A fair volume of business was being transacted and occasionally an order of such a size as would command attention. Manufacturers of carded yarn hosiery were very busy and as a result the prices of carded yarns were stiffened quite a little during this period. Combed yarns remained strong and mercerized yarns held a prominent place in the list with indications that they would go higher. The stage of uncertainty concerning the probable effect on yarn prices of the varying raw material prices continued through this period of the month and as a result there was little activity in yarns. There was no hint of softening in the prices however.

As the month closed the demand for yarns seemed to be quieter with the exception of the finer varieties, but the prices are still fairly firm and the market may be said to be holding its own. At Philadelphia the spinners quotations were a trifle off from the highest prices reached some weeks ago, but they are still well up the line. The spinners however were in a strong position as most of their mills are well sold ahead and it is reported that some houses even refused to quote for late fall delivery. The majority of the spinners expressed themselves as well satisfied with the present condition of the market. The New York quotations at the close of the month are as follows:

SOUTHERN SINGLE SKEINS.

4s to 8s	17½@18	22s	20½@21
10s to 12s	17 @18	24s	20½@21
14s	18½@19	26s	21 @21½
16s	19½@--	30s	25 @26
20s	20½@21	40s	30 @32½

SOUTHERN TWO-PLY SKEINS.

4s to 8s	19 @19½	36s	32 @33
10s to 12s	19 @19½	40s	34½@35
14s	19½@--	50s	42 @--
16s	20 @--	60s	45 @46
20s	21½@22	3-ply 8s upholstery	18 @--
24s	23 @24	4-ply 8s upholstery	18 @--
26s	23½@24		
30s	26½@27		

SOUTHERN SINGLE CHAIN WARPS.

10s to 12s	18½@19½	24s	21½@--
14s	19½@--	26s	22 @--
16s	20 @--	30s	26 @--
20s	21 @--	40s	33 @--
22s	21 @21½		

SOUTHERN TWO-PLY CHAIN WARPS.

8s to 10s	18 @19	26s	25 @--
12s to 14s	20 @21	30s	27 @--
16s	21½@22	40s	32 @--
20s	22½@--	50s	42 @--

SOUTHERN PEELER FRAME CONES.

8s	18 @--	18s	20¾@--
10s	18½@--	20s	21¼@--
11s	18¾@--	22s	21¾@--
12s	19 @--	24s	22¾@--
14s	19½@--	26s	23¾@--
16s	20 @--	30s	24 @24½

AN ENGLISH VIEW OF THE COTTON SITUATION.

The following editorial remarks from one of our English *exchanges*, expresses a sentiment that is, we believe, generally accepted by many of those interested in British textile questions:

"The members of the Textile Institute are to be congratulated on the prominence given to the question of raw cotton supply at their meeting in Manchester last Friday. No subject could be more worthy of their consideration. The supply of the raw material is not only of vital importance to the prosperity of the cotton trade, but affects its very existence. Although the American crop this year has been a large one, there can be no guarantee that the climatic conditions to which it was largely due will continue. But even if a succession of similar large crops were forthcoming it will not take many years before the growing needs of the world will again cause a shortage. According to estimates made some years ago by authorities, the needs of the world are increasing at the rate of 400,000 bales per annum. The old sources of supply cannot cope with this ever-growing demand, and it is imperative that new fields should be opened and developed. The British Empire contains sufficient suitable undeveloped land upon which to grow cotton to supply all our needs. It should be borne in mind that the bulk of our sources of cotton supply lie in the hands of foreigners, who are rapidly increasing their own consumption of cotton. Private enterprise has conspicuously failed to remedy this grave condition of affairs. It is high time the Government stepped in, as this is a national question, affecting the second largest industry in the country. There is no more discredit in asking for Government assistance in this matter than in soliciting the coppers of impoverished operatives for the same object."

COTTON MANUFACTURING.

COTTON MILL MACHINERY CALCULATIONS.

BY B. M. PARKER.
(*Contributed Exclusively to* COTTON.)

PART XVI.

TAKE-UP GEARING.

Referring to Fig. 40, the bottom cone drives the take-up shaft by a 16 into a 48-tooth gear at a speed, as we have before found, of 182.61 R. P. M. The take-up shaft carries the take-up gear which drives the sun-wheel and provides for the excess speed of the bobbin necessary to wind on the delivery of the front roll. As the excess speed of the bobbin is the only speed we need to consider, it being the only one affected by the take-up gear, the total speed of the bobbin need not be figured.

This 47.6 R. P. M. represents the speed of the sleeve gear gotten from the sun-wheel. Then the speed of the sun-wheel is $47.6 \div 2 = 23.8$ R. P. M. There are 140 teeth in the sun-wheel, so the speed of the sun-wheel, multiplied by its number of teeth and divided by the speed of the take-up shaft, will give the size of the take-up gear to use.

$$\frac{23.8 \times 140}{182.61} = 18.2 \text{ or } 18 \text{ teeth in the take-up gear.}$$

After the proper take-up gear has been put on and the correct starting position of the cone-belt determined to give the proper tension on the roving during the winding of the first layer on the bobbin, there is no need to change the size of the gear.

By a similar method of calculation, the cone-gear can be found on those frames that use this gear as a change point instead of a take-up gear. There is one disadvantage

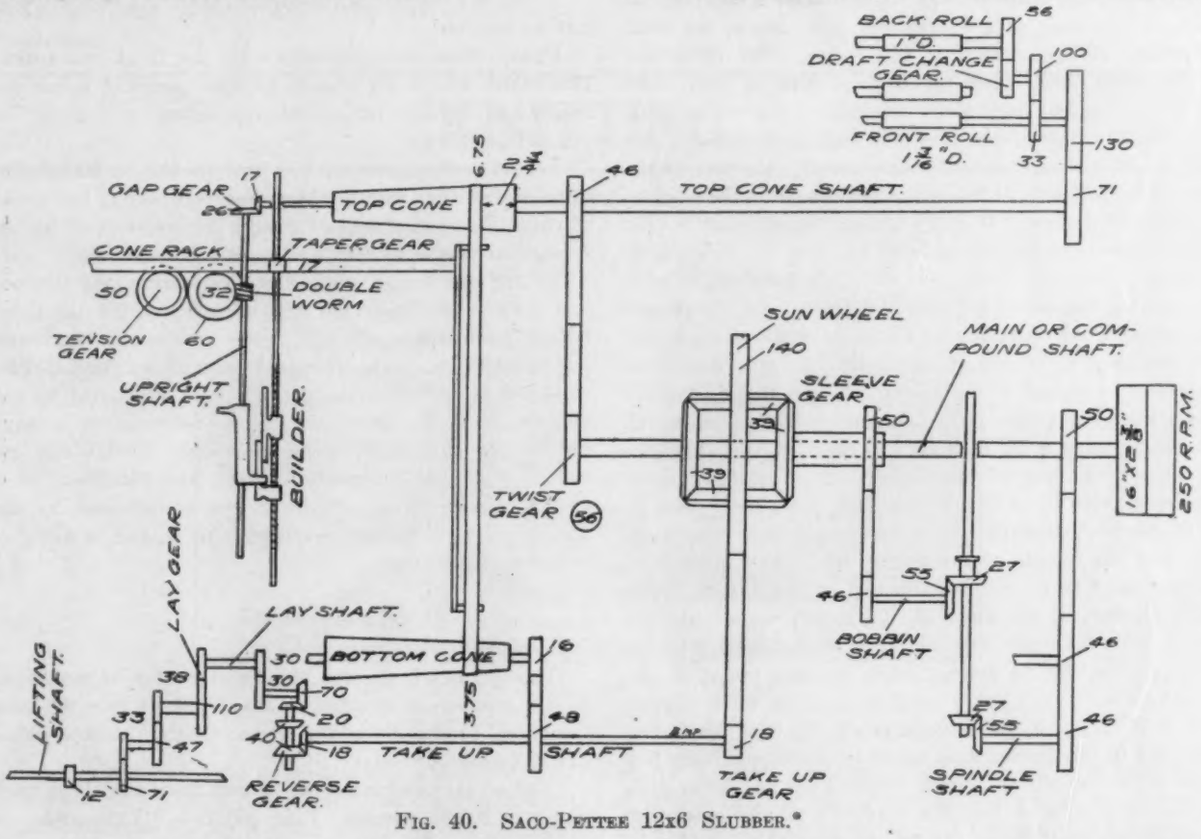


FIG. 40. SACO-PETTEE 12x6 SLUBBER.*

We have found that the front roll delivers 620.113 inches of roving per minute and the circumference of the 1⅞-inch bobbin to be 5.89 inches, hence, the bobbin will have to make 105.3 R. P. M. to wind on the roving delivered by the front roll. This is the excess or winding speed of the bobbin, being derived from the bottom cone and being entirely independent of the bobbin speed gotten from the main shaft.

Starting with this speed and following the train of gears back to the sleeve gear, we get the following:

$$\frac{105.3 \times 27 \times 46}{55 \times 50} = 47.6 \text{ R. P. M.}$$

in changing the gear on the bottom cone, to change the speed of the bobbin at the start, which is not present when the take-up is changed and that is, when it ever becomes necessary to change the cone gear, we change the value of the train of gearing that drives the rail and the lay of the roving on the bobbin is altered to a certain extent. When the take-up gear is altered, the only change made is in the speed of the bobbin and, as this is present throughout the complete building of the bobbin and all the other motions are left as before, the tension gearing or traversing of the cone belt is in no wise affected. No change gear should

*Reproduced from last month for convenience of reference. —Ed.

ever be placed in such a position that a change in its size will affect the value of any other train of gearing that is controlled by another change gear.

The builder is carried in a suitable frame mounted on the bobbin rail and moves with the rail. The two sliding builder jaws are mounted on a right and left handed screw, so that, turning the screw will cause the builder jaws to move closer together or farther apart, thus decreasing or increasing the length of the traverse. On the end of this screw is connected a square rod, which slides through a square hole in the center of the taper gear, this latter, gearing direct into the belt rack. Now, as the belt rack is moved at the end of each layer wound, the taper gear is turned, thus turning the screw and closing the builder jaws together, thus causing the next layer wound to be shorter than the previous one. This is repeated after each layer and causes a gradual reduction in the length of the layers put on, giving the taper on the ends of the bobbin.

The traverse is shortened ½ coil at each reversion of the rail and, as there are 66 reversions to the rail to wind the full bobbin, the traverse will be shortened a total of 33 coils. The roving lays 8 coils per inch, hence, the total shortening of the traverse is 4⅛ inches. One revolution of the taper gear closes the builder jaws ¾ inch, then $4.125 \div .75 = 5.5$ revolutions needed to the taper gear. The total traverse of the cone-belt rack, in building a full bobbin, is 28.5 or 91.2 teeth, consequently, the size of the taper gear will be: $91.2 \div 5.5 = 16.6$ or 17 teeth.

The production of a fly frame depends upon the spindle speed, or amount of twist put into the roving; the number of sets or doffs per day; the number of ends broken; the number of spindles to a frame; and the general efficiency of the operative. As all of the above conditions are variable, it is almost impossible to give a definite statement in regard to the amount of time lost during the operation of a frame. On fine and jack fly frames, all conditions being good, making 6 to 10 H. R., an allowance of 10 per cent loss of time should be sufficient, on intermediates, from 10 to 14 per cent and on slubbers from 12 to 25 per cent, depending upon the size of the roving being run and the length of the frame used. For instance, a slubber on .4 H. R. will run about 11 doffs a day, while the same slubber, at the same spindle speed, would only run about 4.75 doffs per day on .8 H. R., consequently, the loss of time, due to doffing, when running the .4 H. R., would be more than 2 1/3 times as great as when running the .8 H. R., and the percentage of the total production obtained in the former case would be correspondingly less. This is true on all the frames. Some mills use doffer girls, whose duty it is to help the tenders doff and creel their frames, one girl being placed to a certain number of frames. Where this system is used, the percentage of production is larger.

All frames are equipped with a clock which registers the number of hanks run. The mechanism of the clock is run from a worm on the end of the front roll and is adjusted to the size of the roll so that it will register one hank when the roll has made enough revolutions to cause it to deliver 840 yards of roving. The clocks should be read at the same time every day, thus showing a record of each day's run for each frame and operative, giving a comparison between the efficiency of the operatives.

The actual production of the frame in pounds per day can be found by the following rule:

Multiply the hanks registered on the clock by the number of spindles on the frame and divide by the H. R. being run.

Example: A fine frame is running 6 H. R.; the spindle speed is 1200 R. P. M.; the twist per inch is 2.92 turns; and the front roll is 1⅛ inches in diameter and is making 116 R. P. M. The hank clock registers 7.7 hanks for one day's run and the frame has 160 spindles, what is the production in pounds:

$$\frac{7.7 \times 160}{6} = 205.33 \text{ lbs. per day.}$$

The above gives a correct idea of the production of the frame and, where several frames of the same size are running on the same H. R., an average of the clock readings of all the frames can be used to figure the total production that is being turned off, but it gives us no idea of the per cent of production that is being produced. To do this, we must calculate the theoretical production of the frame and compare the two sets of figures.

To get the theoretical production, there are two methods that we can use:

First: Base our calculations on the front roll speed. This varies with every change in twist gear and should be ascertained before making the calculation or the results will not be correct.

Second: Base our calculations on the speed of the spindles and the twist in the roving. However, the speed of the spindles is often not what it is supposed to be, on account of loss of power, due to belt slippage, etc.

Taking the second method and calculating the production without allowance for loss of time, we get the theoretical production. Spindle speed divided by the twist per inch gives the inches delivered per minute: $1200 \div 2.92 = 410.96$ inches of roving per minute. Multiplied by the minutes in a day gives the inches delivered in a day: $410.96 \times 600 = 246{,}396$ inches per day. Divide this result by 36 to get the yards per day, and $246{,}396 \div 36 = 6844.33$ yards. Then divide the yards delivered by the number of yards in one pound of 6 H. R. and it will give the pounds produced.

$$\frac{6844.33}{6 \times 840} = 1.358 \text{ lbs. produced.}$$

This amount is for one spindle and must be multiplied by the number of spindles in the frame to give the total theoretical production of the frame. Then: $1.358 \times 160 = 217.28$ pounds per day.

The actual production, as figured from the clock reading, was 205.33 pounds. Then $205.33 \div 217.28 = 94+$ or a production of a little over 94 per cent, showing a loss of time of nearly 6 per cent.

In running the card-room, the theoretical production for the whole room can be figured and a comparison made with the actual results obtained from the clock readings, showing, at a glance, the per cent of possible production being turned off and giving an accurate idea of the efficiency of the machines and operatives.

If we figure the theoretical production from the front roll speed, we get the following, the front roll being 3.53 inches in circumference:

$$\frac{3.53 \times 116 \times 600 \times 160}{36 \times 6 \times 840} = 216.65 \text{ pounds.}$$

This compares closely with the 217.28 pounds obtained from the former figuring above, the difference being explained in the handling of the decimals.

It is not possible to work out a production constant for fly frames that would be applicable to any and all conditions, as all the quantities in the production calculation are variable to a large extent. However, assuming the conditions mentioned in the example to be present, the production constant, based on one spindle and no allowances for loss of time, would be:

$$\frac{1200 \times 600}{36 \times 840} = 23.8.$$

If we divide this constant by the product obtained by multiplying the twist per inch by the size of the hank roving, we will get the pounds produced by one spindle.

A production constant of this kind, based on the conditions as actually present on the machines, would be useful in determining the theoretical production on any number of frames, for any size roving and give, at a glance, the amount of roving to be expected from any given number of spindles.

In getting the average number of roving or yarn that is being produced on a set of frames, we have to base the figures on the total length turned out and the total pounds produced. The rule is: Divide the total hanks produced by the total pounds produced.

Example: A card room has 20 fine fly frames of 160 spindles each; 6 frames on 3 H. R., the clock readings average 9.5 hanks per day; 4 frames on 3.50 H. R., the clock readings average 9 hanks per day; 7 frames on 4.5 H. R., the clock readings average 8.25 hanks per day; and 3 frames on 5.5 H. R., the clock readings average 7.6 hanks per day. What is the average H. R. being run?

$6 \times 160 \times 9.5 = 9120$ hanks.	$9120 \div 3 = 3040$ lbs.
$4 \times 160 \times 9. = 5760$ hanks.	$5760 \div 3.5 = 1646$ lbs.
$7 \times 160 \times 8.25 = 9240$ hanks.	$9240 \div 4.5 = 2053$ lbs.
$3 \times 160 \times 7.6 = 3648$ hanks.	$3648 \div 5.5 = 663$ lbs.
Total hanks $= 27768$	Total pounds $= 7402$

Then: $27{,}768 \div 7402 = 3.75$ average H. R. being run.

(To be continued.)

KNITTING.

(Contributed Exclusively to COTTON)

BY H. K.

Lanark, notwithstanding its modest size and population of only 6,000 people, takes first place in the manufacture of full-fashioned sweaters for womens' wear. It will perhaps be interesting to the readers of COTTON to follow the development of this branch of the knit goods trade as it is carried out in Lanark, Scotland.

Linnville Hosiery Factory which is owned by the firm of A. MacDougall & Co., Inc., is the result of the development of the sweater and other fancy knit goods. In 1899 the present site of the factory was purchased and suitable buildings were then built, this building was doubled in size in 1907, but with the increasing business, it was found necessary to increase the building in 1910.

A brief description of the building is necessary in order that a comparison might be made with the style of building used in this country. The factory consists of three large brick buildings, the roofs being of the saw-tooth type with northern exposure windows. The brick work is relieved by well proportioned panels of sand colored rough casts, overhung with massive stone coping. At the rear of the factory buildings is the dining room where the employees from out of town are supplied with a hot lunch free of cost. The founder of the firm is a strong believer in the best hygenic conditions. Realizing that his employees spend the greater part of their wakeful hours within the walls of the factory, the rooms are supplied with the maximum of sunshine and the interiors are so painted as to diffuse the plentiful light thrown into each workroom. Wash-stands are provided with hot and cold water, this is to ensure the cleanliness of the garments as they are handled from one operation to another. The rooms are lighted by electricity generated by the company's own plant. The heating is done by 6-inch steam piping carried about 7 feet from the floors.

The yarns used are bought from the principal spinners

in England and Scotland, Cross-bred and Australian wools both being used. In quality they range from our 3/8s blood up. In special garments, Shetland, Alpaca, Mohair and Camel hair yarns are used. A large assortment of shades are carried, as many as 80 shades being carried in one quality of yarn. The sizes of the yarns used are principally 2/16s and 3/16s worsted counts. The yarns as they are received are done up in 6, 8, or 12 pound parcels with the quality, size and shade clearly marked on the outside. Lots of 100 pounds or more are stock dyed, but the spinners will dye lots of 30 pounds of a shade to suit the manufacturer. These small lots are skein dyed.

The yarn is now passed to the winding room where it is wound on bottle bobbins ready for the knitter. Each winder has to attend to her own knitters and is responsible if the knitter is delayed for lack of yarn. Girls are employed for the purpose of carrying the yarn from the winding room to the knitters so that the knitter may attend to the knitting part of her work. The knitting department has been brought to a high state of efficiency by specializing the various operations of knitting. There are girls who, knit sleeves, others who knit fronts, others the backs, some others who knit the collars and cuffs and so on according to the number of sections contained in the garment. The knitters are provided with the knitting instructions for all garments which they may be called upon to make, the styles of the garments are known by their number and the knitter uses the knitting draft provided for this style. Each knitter has her own individual method of marking her work, so that should any fault be found in the garment it can be traced to the knitter. A colored thread mark is used to denote the size of the garment. As the knitter hands in her work she must see that the order ticket is returned to the stockroom and she is credied with the work done. Each section is fashioned according to a pre-determined shape on the machine thus giving selvage edges to all the sections. The joining together

FIG. 2. THE FINISHED SWEATER.

of the various sections is divided over a number of operations, the sides are first seamed to the back part of the garment, cup seamers being used. The next operation is looping the sleeve to the body of the garment and the collar is also looped. The garment is now sent back to the seamer who seams the sleeves. Button holing, sewing on of buttons

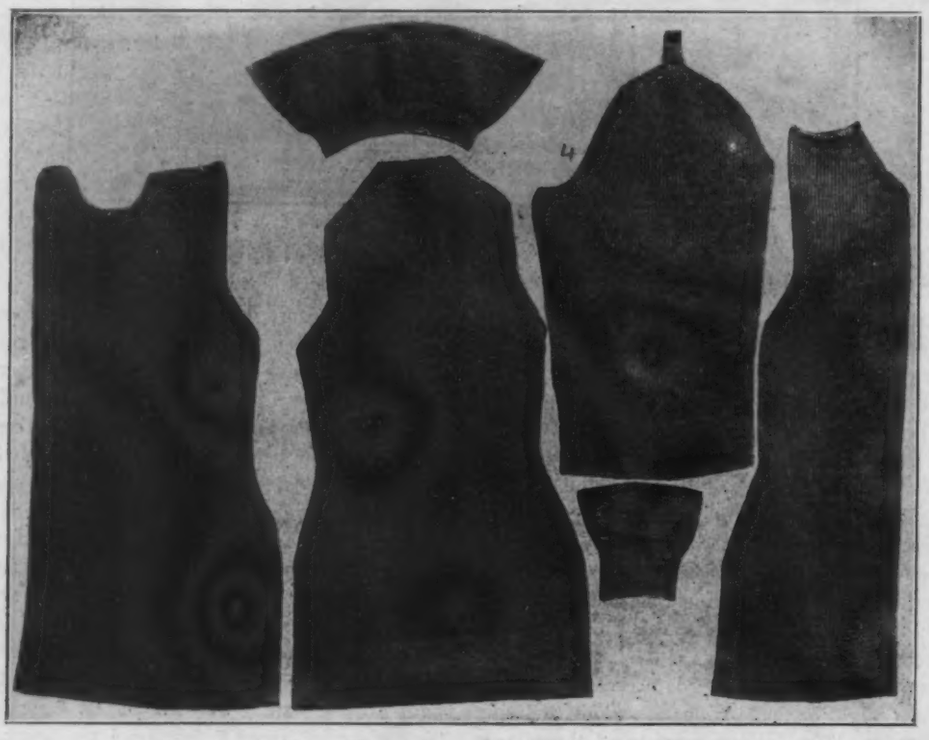


FIG. 1. A FULL FASHIONED GARMENT BEFORE SEAMING.

FIG. 3. INTERIOR OF THE KNITTING ROOM. FULL FASHIONING ON HAND MACHINES.

FIG 4. JOINING THE PARTS ON THE LOOPERS.

and sewing on of special tags is gone through before the garment is passed on to the inspectors. The inspectors fasten all loose ends of yarn and examine the garment for size and defects. The garments are given a light steam press and afterwards folded and boxed in individual boxes. It may be interesting to mention here that the jobbers send their own special labels and tags to the manufacturer at cost price. The manufacturer looking after the special colors required for the boxes.

To give the readers an idea of what the sections look like before they are finally seamed up, Fig. 1 has been specially prepared. The sections are as follows: 1 is the large front, 2 is the small front, 3 the back, 4 the sleeve, 5 the collar, 6 the cuff. The finished sweater is shown in Fig. 2. This garment is full-fashioned containing no cut selvages and is made to conform to the contours of the body.

Fig. 3 shows the interior of the knitting room in which these garments are knitted. The machines are all hand machines of the lamb type 5 and 7 needles per inch. Each operator is provided with a small bag for any waste which may be made and also provided with a box in which the knitter puts the work as it is completed on the machine. In order to get the best results from learners special instructors are provided whose duty it is to see that the learner is fully taught in the operating of the machine and also the manipulating of the needles in fashioning. In this way the regular knitters are not disturbed by having to take care of learners and at the same time being responsible for the work. As each learner becomes proficient on the machine and able to get along without the aid of her instructor, she is put on piece work. By this method a special incentive is given to the learner to become proficient as soon as she can.

The loopers are shown at work in Fig. 4. Small diameter loopers are used and it may be noticed that the operators put the work on to the looper points at the left side of the machine and not directly on the front as in the case of looping hose and half-hose. The machines are in a much lower position than that required for the looping of hosiery. The looping machines are 12, 14 and 16 point machines. They are all of the single thread type using a chain stitch.

In Fig. 5 is shown machines which are fully automatic and driven by power. The fashioning being done automatically on the machine. The machines shown are six head machines producing six garments at once.

FIG. 5. SIX HEAD, FULL AUTOMATIC POWER KNITTERS.

Machines of the link and link type are also used in the production of sweaters, scarfs and other fancy knit articles. These machines are operated by men as the width of the machine and power required make the machine too heavy for a girl to operate satisfactorily.

All the garments produced are fashioned. No garments of a cut up nature are made. All white garments are knitted in the white, machines are carefully cleaned and free from oil and no scouring or finishing process other than a steam press is used.

Practically every kind of knitted garments is turned out at this factory. Golf coats, vests, sweaters, jerseys, caps,

mufflers and knicker hose are all manufactured by this firm.

The scarcity of help has always been a hard problem for this progressive firm to solve. The help is drawn from surrounding towns, the girls having to travel by train. To make the problem easier arrangements were made with the railroad company to provide special rates for the employees of this firm. The result is that girls coming from out of town can do so at half the usual rates. Another innovation by this firm is the provision made for girls, who owing to ill health are incapacitated for work, when convalescent they are sent away to a seaside resort for two weeks and all the expenses defrayed by the firm. Nothing in the nature of a strike has ever been heard of in the history of the firm which has now entered on the twenty-second year of its existence. The help are satisfied and should any occasion come in which a dispute is likely to arise the principal of the firm is always willing to hear the girls on any grievance which they may be likely to have. A 50 hour week is worked all the year round independent of the long hours worked by other firms.

This firm has achieved results which were undreamed of in the matter of production and efficiency. The Bonus system is used and a special system used for each girl. Each girls work is closely studied and the maximum production noted and on this basis the bonus rate is fixed. Each days production of each girl is recorded so that the production of each girl is watched and kept up to the maximum. This is a check on the efficiency of the machines and no machine is allowed to stand long idle in order to be fixed or adjusted. The machine fixer is right on his job and the quality and efficiency of his work is shown in the production of his section.

As artists in the fancy knit goods trade this firm has built up an enviable reputation for high class goods. Exports are made to Germany, and the British Colonies and not a few are imported into this country by some of our leading dry goods stores. The firm's products are handled through a London commission house, but in addition the firm does not bind itself to sell exclusively through this house. A large number of orders are sold direct to the trade. In all these undertakings the personality of the founder of the firm is pre-eminent and it is his ingenuity and enterprise that has brought to them the highest element of commercial success.

WEIGHTING KNIT GOODS.

BY Z.

EDITOR COTTON:

I am enclosing a piece of knit fabric which I would like to have weighted to a small extent in the sizing process. What would be the best method for accomplishing this result? Do you believe it would be better to size the yarn before knitting, or size the material after knitting with a weighted size?

All knitters agree that it is easier to knit yarn in the natural shade. Dyed, bleached and mercerized yarns all prove troublesome in the knitting process. Lubricants are used to overcome these troubles and are to a great extent successful. Yarns which have been sized or weighted would be liable to give trouble. The friction given to the yarn by the needles would have tendency to loosen up the size and this coming off would get lodged in the latches of the needles allowing them to become stiff and cause bad work. Without making an actual test it is difficult to say whether the sizing of the yarn or the fabric would be the better way. If the yarns are received at the mill bleached, it might be possible to apply some weighting solution to the yarn in the winding process. Some winders are provided with a trough for this process. It must be kept in mind however, that the yarns must remain soft and elastic, whatever the size used may be.

The weighting of the finished fabric suggests itself as the better method, although the sizing of knit frabrics is not a general custom. The fabric after bleaching would have to be run through the sizing bath. But herein lies the difficulty and that is the application of the size. Such solutions as are used for cotton fabrics might be successfully tried. If a starch solution was used, softners such as Egyptian gum, tallow, cocoanut oil, glycerine, etc., would have to be used. Glauber and Epsom salts are two good weighting materials. The latter is a good filler and is soluble in water. If it was only desired to give the fabric a light size the following might prove sufficient for the purpose. Three handfuls of Bran, six gallons of water and some gum arabic. Stir the bran into the water allowing it to stand a little, then take off any foreign matter and pour the liquid into a pan add a little gum arabic and bring to a boil, stir the liquid until it boils. The fabric submitted was bleached, napped on the inside and knitted in the half-cardigan stitch. H. K.

ONE OF "COTTON'S" PROMINENT CONTRIBUTORS.

During the past sixteen months COTTON has presented to its readers a number of very interesting and instructive articles on knitting subjects from the pen of Professor William Davis, M. A., principal of the Hawick Technical Institute, of Hawick, Scotland. While Professor Davis is too well known to most of the knitting readers of COTTON to need any further introduction, the following brief sketch is presented for the benefit of those who may still be unacquainted with his brilliant career.

Mr. Davis inherited a great power for work from his father, who was one of the swiftest weavers, and made not only much work, but excellent work of its kind. As a pattern weaver there were very few, if any, who were equal to Mr. Davis' father. After leaving school, where he had taken a high place, he wanted to learn a trade, and at his father's request he was taken as an apprentice in Wilson & Glenny's pattern weaving department, where he secured six years' practical experience in weaving and designing, but at the same time he was studying at the textile classes. He passed through the various stages of examinations for the City and Guild of London, and holds elementary, advanced, and honor certificates in woolen and worsted weaving and designing, and also the various certificates in knitted fabrics, which is a new department of the City and Guild Syllabus. He also had one year's experience as assistant designer with J. & D. Paton & Co, woolen and worsted manufacturers, Tillicoultry.

As the best student in the Hawick Textile School, he was awarded the Woolen Trade Traveling Scholarship in 1902, and studied for the next two years as a day student in the German Technical Weaving College at Reichenberg. He holds the diploma of this school, with a special mark for excellence in the German language. Mr. Davis next

took up the work of commercial and technical teacher, and has taught French and German classes under Galashiels school board; weaving and designing under Alva, Tillicoultry, and Hawick school boards. He entered the University of Edinburgh in 1904, and took fourth place in the entrance examinations, gaining a Heriot Bursary. Three years later he graduated Master of Arts, passing in the following subjects: Latin, French, German, Mathematics, Logic, Natural Philosophy and Education. He also took the honors courses in French and German. In 1904 he was first in Great Britain for the examinations in framework knitting and hosiery manufacture and gained the silver medal. Mr. Davis has published a "Textbook of Hosiery manufacture," and another on the "Technology of Weaving." In 1909 he was appointed to his present position as principal of the Hawick Technical Institute, where he lectures on the technology of the weaving and knitting industries.

He is ever discovering some fresh field for his energies, and accordingly a year ago he established classes in Hawick for repairing the imperfections in textile materials, and so

WILLIAM DAVIS, M. A.

successful have these been that flourishing classes in this subject have been established at Galashiels and Selkirk. He is ever alive to introduce something fresh, and seeing the great demand that has lately existed for knitted spencers and coats for ladies wear, he has organized a class for fancy knitting.

During the past session he has organized and taught classes in weaving and designing under the Carlisle and Dumfries Langholm education authorities. Mr. Davis is a research scholar of the textile department of Leeds University, and is shortly to publish the results of this work, illustrated by photo-micrographs. Some of this material has already appeared in the pages of COTTON, and many other articles are being prepared and will continue to appear from time to time in the Knitting Department.

STANDARDIZATION OF THE KNITTED FABRIC.

A FURTHER DISCUSSION OF THE SUBJECT INTRODUCED IN COTTON FOR MARCH. THE RELATION OF THE YARN TO THE GAUGE.

(*Contributed Exclusively to* COTTON.)

BY WILLIAM DAVIS, M. A.

In the March issue of COTTON there appeared an article on the knitted fabric which may be regarded as the forerunner of the present one, inasmuch as it is intended to use the results arrived at as a basis of proposed standardization. It is satisfactory to note that several other writers on knitting technology are also engaged on work of this kind and it is to be hoped that our combined efforts may bring about a clear knowledge of the principles of fabric structure involved in knit goods.

My former article recorded a series of measurements of machine dimensions of the general "Cotton's Patent" spring needle variety, showing how the space in a range of frame gauges was allocated as regards needles, sinkers and yarn spaces. The space allowed for needles was found to vary between 35 and 44 per cent but that this variation did not occur in any regular fashion from coarse to fine gauges. Similarly it was found that the percentage of space occupied by the sinkers in various gauges varied between 15 and 18. As a starting point therefore we shall take a general average of 40 per cent space for needles and 16.6 per cent space for sinkers in the range of machine gauges referred to. As the question of the relation of the size of yarn to the frame gauge was only taken up in a casual fashion, we propose now to give it more attention.

For convenience the worsted yarn, two-fold was taken to correspond to the frame gauge as being a simple arrangement complying in a general way with practical work. Anyone with a knowledge of yarn structure, however, will see readily that such a scheme cannot be upheld in rule of theory. We have valuable aid in considering this problem, when we refer to what is accepted for the setting of fabrics in the sister industry of weaving, the sett being indicated by the number of threads which occupy one inch in the loom. The rule consists in making the sett vary as the square root of the yarn counts. Thus if a 12s yarn gives a suitable cloth with 48 ends per inch, the sett of a similar fabric in 18s yarn can be calculated as follows:

$$\sqrt{12} : \sqrt{18} :: 48 : X.$$

$$X = \sqrt{18} \times 48 \div \sqrt{12} = 18 \times 48 \times 48 \div 12 = 3456$$

Extracting the square root of 3456 gives us 59 ends per inch as the answer.

The following type of problem can also be worked. Given that 20s yarn has 62 ends per inch, find a suitable yarn for a similar cloth with 42 ends per inch.

$$62 : 42 :: \sqrt{20} : X$$

$$X = 42 \times \sqrt{20} \div 62 = \frac{42 \times 42 \times 20}{62 \times 62} = 92 \text{ counts for}$$

new cloth.

These rules follow as a direct consequence of the method of estimating the diameter of any yarn, explained and illustrated in the March issue of COTTON. This was to extract the square root of the yards per pound and the resulting number was taken as representing the diameter reciprocal

or the number of threads which would lie together side by side. The diameter of the yarn was thus shown to be inversely proportional to the square root of the counts and as the diameter is the chief factor in determining the closeness with which threads can be placed or sett side by side, we are able to deduce the above setting rules as a direct consequence.

Now in using the weaving rule of setts to arrive at a similar rule for estimating frame gauges suitable for given yarns, we must take certain differences into careful consideration. In the loom, we do not require to allow for space taken up by the machine parts as the threads are arranged touching each other side by side. In the knitting frame, the size of the loop forming parts may play an important part in the fabric structure by allowing more or less space for the yarn to occupy. By drawing out a standardization of the machine parts however so that the same percentage of space is allowed for needles and sinkers for every gauge, we at once overcome this difficulty and are able to formulate rules corresponding to the setting rules for woven fabrics.

To make the points clear we shall work out a number of examples for fabrics based on the figures in the subsequent tables.

Example 1. If 9s yarn makes a suitable knitted fabric on an 18 gauge frame, find the counts required to make a similar knitted fabric on a 16 gauge frame.

The new yarn number will be inversely proportional to the square root of the given yarn number, therefore

$18 : 16 :: \sqrt{9} : X.$

$X = 16 \times \sqrt{9} \div 18 = 16 \times 16 \times 9 \div 18 \times 18 = 7.11s$ count.

Example 2. If 16s yarn makes a suitable knitted fabric on a 24 gauge frame, find the counts required to make a similar fabric on a 30 gauge machine.

$24 : 30 :: \sqrt{16} : X.$

$X = 30 \times \sqrt{16} \div 24$ Squaring the expression we obtain $X = 30 \times 30 \times 16 \div 24 \times 24 = 25s$ count.

Example 3. It is found that 11s yarn makes a suitable knitted frabric on a 20 gauge frame, find the gauge number of the machine to use to work a similar fabric with 14s yarn count.

Again the gauge number varies as the square root of the counts, therefore

$\sqrt{11} : \sqrt{14} :: 20 : X$

$\sqrt{14} \times 20 \div \sqrt{11} = X.$ Squaring the expression we obtain,

$X = 14 \times 20 \times 20 \div 11 = 509.$

Extracting the square root of 509 we get 22 gauge approximately.

Example 4. If 16s yarn works a suitable fabric on a 24 guage frame, find the gauge number to work a similar cloth with 6s yarn.

$\sqrt{16} : \sqrt{6} :: 24 : X.$ Squaring the expression we have $X = 6 \times 24 \times 24 \div 16 = 216.$ Extracting the square root we obtain a 15 gauge frame as the answer.

From these considerations it will be evident that the rule which causes the size of yarn to vary directly as the gauge, although employed in a general way by many practical men, cannot be defended on theoretical grounds. The rule that the yarn count varies as the square of the gauge was first set forth by Professor Willkomn and has since been supported by other writers notably Mr. Ernest Tompkins in the March issue of the Textile Manufacturers Journal.

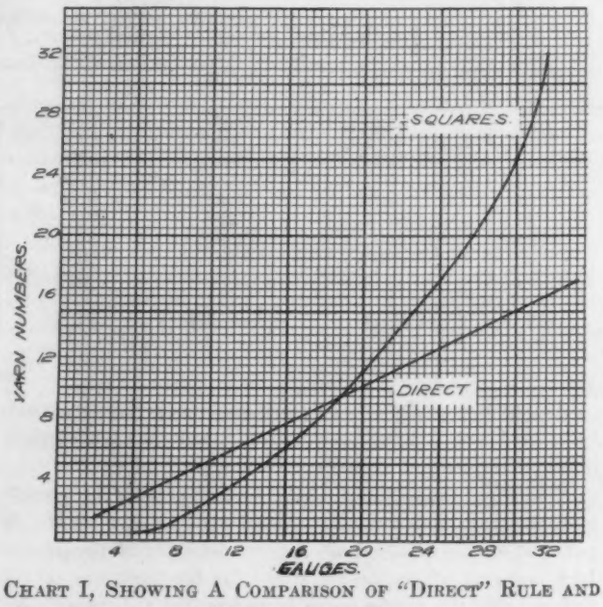


CHART I, SHOWING A COMPARISON OF "DIRECT" RULE AND RULE OF SQUARES.

Both the direct rule and the rule of squares may be brought into line with practice in the medium and finer gauges, but in the coarser gauges the rule of squares gives better results than the direct rule which makes the counts too fine. In the finest counts, we are rather confused by the practice of having summer and winter weights of goods worked on the same frame, after giving quite a considerable range of counts made on the same machine. In such gauges the "direct" rule gives a coarser yarn than is usual in practical work.

TABLE I.

Comparison of counts found by "direct" rule and "rule of squares."

Guage Number	Suitable Yarn by "direct" rule	Suitable Yarn by rule of squares
	Worsted count	Worsted count
7	2-7s = 3½s	= 1.36s
9	2-9s = 4½s	2-4½s = 2¼s
12	2-12s = 6s	2-8s = 4s
16	2-16s = 8s	2-14s = 7s
18	2-18s = 9s	2-18s = 9s
20	2-20s = 10s	2-22s — 11s
24	2-24s = 12s	2-32s = 16s
27	2-27s = 13½s	2-40½s= 20¼s
30	2-30s = 15s	2-50s = 25s
34	2-34s = 17s	2-64s = 32s
Col. 1	Col. 2	Col. 3

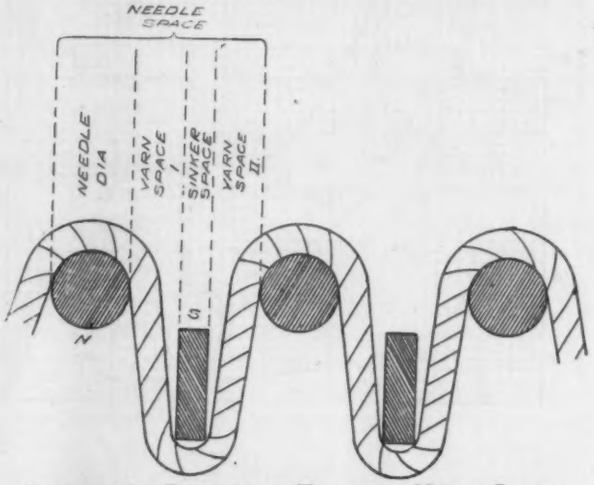


DIAGRAM 1. REPRODUCED FROM THE MARCH ISSUE.

Col. I Gauge	Needle Space	40 per cent. of needle space for needle diameter	16.6 per cent. for sinker thickness	Col. III plus Col. IV	Col. II minus Col. V ÷ 2 = yarn space	Yarn diameter by rule of squares Col. III Table I	Clearance Col. V minus Col. VII
	Inch	Inch	Inch	Inch	Inch	Inch	Inch
7	.2174	.0869	.0360	.1229	.0422	.0365	.0103
12	.1250	.0500	.0208	.0708	.0271	.0211	.0057
16	.0943	.0377	.0156	.0533	.0205	.0160	.0044
18	.0833	.0333	.0138	.0471	.0181	.0143	.0038
20	.0751	.0300	.0131	.0431	.0160	.0126	.0031
24	.0625	.0250	.0104	.0354	.0135	.0105	.0027
30	.0500	.0200	.0083	.0283	.0108	.0084	.0022
34	.0442	.0177	.0072	.0249	.0096	.0075	.0020
Col. I	Col. II	Col. III	Col. IV	Col. V	Col. VI	Col. VII	Col. VIII

TABLE II.

The figures of the two columns above are given in graph form on Chart 1 where the "direct" rule shows a straight line and the rule of squares a symmetrical curve.

Following the methods of the former article, the present table has been constructed on "standard" lines, allowing 40 per cent of the needle space for the diameter of needle and 16.6 per cent of the needle space for the thickness of the sinkers. By the needle space is understood a distance comprising needle, yarn, sinker, yarn as in Diagram I.

The figures of column VII have been calculated on the yarn numbers corresponding to the table for the rule of squares by taking the square root of the yards per pound as the diameter.

The needle thickness and sinker thickness are added in column V. to give total measurements for machine parts. This is deducted from the total needle space and divided by 2 in column VI to give exact space available for each thread. The actual space taken up by the yarn diameter is shown in Col. VII and Col. VI minus Col. VII gives this space left over for the clearance of the yarns, which varies between 4 and 5 per cent on single thread. Therefore, in the type of spring needle frame under discussion, the proportions are approximately as follows:

40 per cent space occupied by needles.

16.6 per cent space occupied by sinkers.

9.4 per cent space for clearance (on 2 threads).

33 per cent space for yarn.

The curves just constructed are for plain fabrics of average type in worsted yarns and the same method can be employed for any other class of yarn. An experiment can be made, say for cotton, to see the suitable size for one gauge and the rule of squares can be applied to find suitable sizes of yarn for similar fabrics on any other gauge.

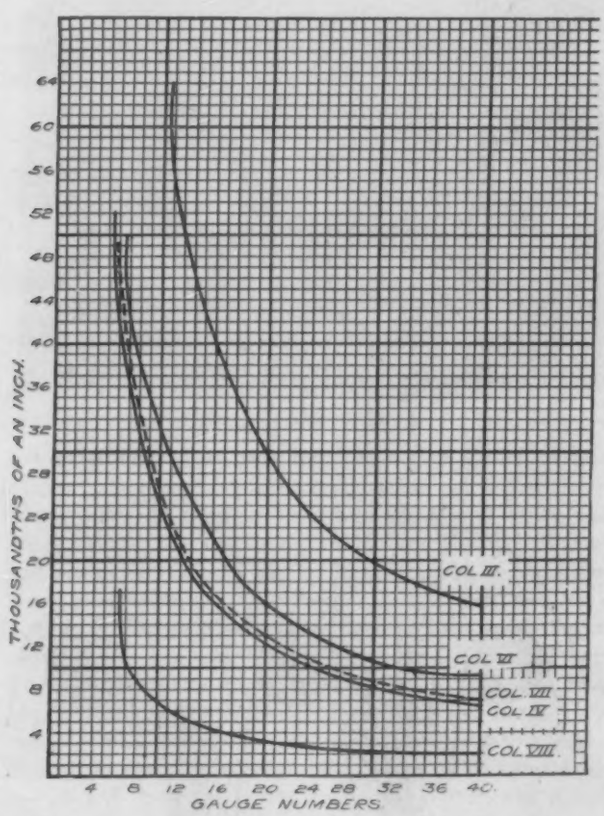


CHART II, SHOWING UNIFORM RESULTS FROM STANDARDIZATION OF PARTS AND RULE OF SQUARES FOR GAUGES.

An American consular officer reports that responsible business men in his district are promoting a mill with a capital of over $1,000,000, to knit men's and women's underwear. They propose to start with an output of about $500,000, with buildings and power to increase to $1,000,000. These men wish to secure quotations from the different American manufacturers of woolen knitting machinery for the mill, and to this end ask catalogues and correspondence from manufacturers. It is proposed to spend about $45,000 in machinery at the start. The persons interested request that communications regarding this matter be sent at the earliest possible moment to the consular officer submitting the report. In applying to the Bureau of Manufactures, Washington, D. C., refer to file No. 8290.

An American consular officer in Germany reports that a merchant in his district wishes to handle American knitted goods and would like to communicate with American manufacturers of articles such as underwear, hosiery, gloves, etc., with a view to importing them into that country. Correspondence may be in English or German. References may be had from the inquirer upon request. For further information apply to the Bureau of Manufactures, Washington, D. C., and refer to file No. 8373.

An American consul reports that a firm of importers and dealers in dry and furnishing goods in his district is desirous of receiving catalogues and price lists of men's cotton knit fleece-lined underwear of American manufacture. It is stated that there is a large and growing demand among the natives of the country in question for such garments. Correspondence should be in English. For further information apply to the Bureau of Manufactures, Washington, D. C., and refer to file No. 8346.

DYEING, BLEACHING AND FINISHING.

BLEACHING KNIT GOODS MADE OF CARDED YARN.

(*Contributed Exclusively to* COTTON.)

BY J. MERRITT MATTHEWS, PH. D.

There is at present a very large amount of low-grade cotton yarn employed for the manufacture of knit goods for underwear. In fact the tendency has been of late years to continually reduce the quality of the yarns employed for purposes of cheapness, and yet so process the cloth after knitting as to thoroughly clean and bleach the fibre so that it makes a good appearance, and in heavyweight goods compare favorably with combed yarns.

By reason of their previous treatment and spinning, combed yarns are very clean and free from extraneous impurities, and the purpose attained in bleaching material made from such yarns is merely to remove the natural color of the fibre and leave it white. Carded yarns, on the other hand, have a large amount of impurity left in the yarn which is not removed by the carding and spinning processes. The cheaper the yarn, naturally the larger the amount of this impurity. Outside of a small amount of miscellaneous dirt and grease, the large amount of impurity occurring in carded yarns consists of bits of seed-hulls, leaf and woody fibre. When the yarn is knit into a fabric these impurities show up as dark-colored motes and specks, clinging chiefly on the outer surface of the yarn, and yet retained with great tenacity by being enmeshed in the interlacing and twisted fibres.

It may be seen, therefore, that the proper bleaching of knit goods made from carded yarns involves two considerations; in the first place, the decomposition and removal of the motes or "sticks"; and secondly, the removal of the natural coloring matter of the fibre itself. On this account, the bleaching involves a much more severe treatment than those goods made from combed yarns, for a process of bleaching which would be amply sufficient to give a good white color on combed yarn would not have the desired effect of removing the motes from the carded yarn.

For example, knit fabrics made of fine quality combed yarns may be bleached very satisfactorily by simply scouring in a warm solution and then treating with a peroxide of hydrogen bleaching bath. Such a treatment, while leaving the goods in an excellently soft condition, would not, however, remove the motes from a fabric made up of carded yarns.

In the consideration of the bleaching process there are two main points to be considered; firstly, the boiling out with alkali; and secondly, the bleaching proper with "chemic," which may take the form of a number of different chlorine solutions. A long experience has shown that by far the principal factor in the successful bleaching of fabrics made of low grade carded yarns is a thorough and well understood boiling out. If the boiling out operation is incomplete or improper, the motes cannot be satisfactorily removed,, even though the subsequent treatment with chemic be sufficient to produce a good white color in the fibre. Furthermore, the less perfect the boiling out, the more violent will have to be the action of the chemic; stronger solutions of both chemic and acid will have to be used, with a consequent danger of tendering the goods and making them harsh and stiff. Besides this, the cost of the bleaching will be much higher than when a better boiling out is given.

There are a number of methods of boiling out in vogue; the particular method used being more or less dependent on the conditions in the case and the experience and personal caprice of the bleacher in charge. The older process of boiling out, and one which is still largely in use, employs open wooden kiers. The goods are folded down in a continuous chain in these kiers, which are merely large round wooden tubs provided with a perforated false bottom, and a slatted wooden top to hold the cloth in position during the boiling. The liquor is circulated by the force of steam injectors in one or several pipes placed on the outside of the kier and connecting with the well at the bottom of the kier beneath the false bottom. The liquor employed for boiling out consists for the most part of a solution of caustic soda, from 3 to 6 per cent of the alkali on the weight of the goods being employed. In connection with the caustic soda there may also be used silicate of soda (from 1 to 4 per cent), soda ash (from 1 to 3 per cent), and sometimes soap and turkey-red oil (soluble oil) are also used. Sometimes proprietary "bleaching assistants" are used in connection with the caustic soda. These compounds are mostly composed of an intimate mixture of caustic soda, soda ash, and silicate of soda finely ground together and sold to the bleacher at a high price. In some cases they are quite efficacious, but their cost is high and the bleacher could make up the same mixture himself at a much lower cost. In other cases, these "bleach assistants" are distinct frauds, being composed of caustic soda ground up with common salt and glaubersalt with more or less soda ash, and their boiling out value is really considerably less than ordinary caustic soda and soda ash.

In the open kier method of boiling out it requires from 10 to 12 hours (usually over night) to obtain a satisfactory treatment of the goods, and this long time in contact with the hot alkali has a tendency to make the cloth harsh, and also to decompose the cotton-wax on the fibre into resinous bodies which discolor the goods and which are difficult to wash out. The use of soap and soluble oil will lessen these defects and leave the goods whiter and softer after the boil. The open kier method also requires a relatively large quantity of chemicals, and a high consumption and waste of steam.

Owing to these disadvantages, many bleachers have introduced closed kiers working under pressure (usually from 10 to 12 pounds steam pressure). Such kiers are constructed of iron and the circulation is produced in a variety of ways. In some, a central inside vomit pipe runs from the bottom well of the kier, and the liquor is forced up this pipe by a steam injector, and is sprayed over the top of the goods. In other kiers, the circulation pipes are on the outside and the liquor is forced around by a special form of steam injector and valve. In another variety (quite popular in England), the circulation is produced by a pump and the liquor is forced through an outside chamber containing a heating coil. A later form of kier, and one which is

becoming very popular on account of its novel and economical method of operation, circulates the liquor by means of a vacuum chest. In this chest there is first admitted high pressure steam which operates an automatic cut-off valve when a certain pressure is reached. At this point connection is made with the liquor at the bottom of the kier, which coming in contact with the high pressure steam immediately condenses it, thus producing a vacuum which draws up the liquor from the kier until the chest is full. This causes an automatic shut-off of the connection with the kier liquor, and opens up the valve admitting the high pressure steam , and the latter both heats up the liquor and forces it over to the top of the goods within the kier. A continuous cycle is thus obtained working under automatic conditions. An excellent boil can be obtained in this kier in 2½ hours owing to the thorough and rapid circulation of the liquor through the goods. The amount of chemicals is also small, a good proportion being 1 per cent of caustic soda, 1 per cent of soap and 1 per cent of soluble oil. The goods come out soft and clean and appear more than half bleached even previous to chemicing. The proportion of steam used is also very small, thus making the boiling an economical process.

After the boiling out operation has been completed it is essential that the goods be given a thorough washing with water in order to remove the soluble and decomposed matters resulting from the action of the chemicals on the impurities in the fibre. These matters are brown in color and mucilaginous in character, and unless thoroughly removed from the cotton immediately after boiling out and before they have had a chance to become dry, may lead to the formation of brown stains. This washing operation is usually conducted in the kier after the boiling off liquors have been run off. A further washing is usually given also after the goods have been taken from the kier and before they are treated with the chemic solutions for the bleaching proper.

There are several methods in vogue for conducting the treatment with chemic. The older method, which is still largely employed, may be called the "continuous process." In this method the cloth is run out from the kier over a roller and through pot-eyes, and is carried into a tank containing the chemic solution consisting of chloride of lime at 2 to 3 degrees Twaddle. The goods pass under a roller at the bottom of the tank so as to keep them submerged beneath the liquor during their passage. The cloth then passes out of the chemic tank through large squeeze rolls so that the excess of the liquor returns to the chemic tank. The goods, however, must not be squeezed with too great a pressure, as it is necessary to leave sufficient liquor in the cloth to do the bleaching. The cloth now saturated with the chemic solution is folded down in boxes or bins, and left undisturbed for 2 to 3 hours, during which time the chemic solution acts on the cloth. Heavy goods naturally require a longer treatment than lightweight material. When the cloth has whitened up sufficiently it is next run through a washing machine, entering one end of the washer and being carried up and down over rollers in a spiral manner until it comes off at the other end of the machine. A good flow of fresh water must be continually running through the washer in order to remove as thoroughly as possible the excess of chemic as well as the soluble products of the bleaching.

After coming from the washer, the cloth is next led through a souring bath for the purpose of decomposing the chlorine compounds still left in the fibre. The souring bath may consist of either a dilute solution of sulphuric acid (vitriol) of about 1 to 2 degrees Twaddle strength, or of a solution of sodium bisulphite (antichlor.). Usually 5 to 8 per cent on the weight of the cloth will be required of antichlor. The antichlor is considered better than sulphuric acid as it neutralizes more quickly and completely the chlorine compounds in the fibre, and there is also less danger of injuring the goods, and furthermore the cloth is apt to be softer to the feel. After the souring operation has been completed it is necessary to give the cloth a very thorough washing with fresh water in order to completely remove all trace of acid or antichlor, for if any acid were to be left in the goods it would cause a weakening of the fibre on drying.

After washing out all trace of acid it is generally the custom to soften the cloth by passing through a bath containing a mixture of soap and oil or some specially prepared softener. In this treatment there is also introduced a small amount of blueing for the purpose of tinting the color of the bleach and throwing it off the yellow caste to a blue tone. The cloth then passes through squeeze rolls and without further washing is hydro-extracted and dried. The continuous process of bleaching is open to several serious objections. In the first place the chemic and sour baths have to be used rather strong, and fresh quantities of the strong chemicals have to be added from time to time as the cloth passes through the baths in order to keep them up to a uniform strength. This is very liable to cause spots and streaks on the cloth by reason of it coming in contact with the strong chemic or acid. This is a very common defect to be found in this method of bleaching. Again, by its very nature the process is uneven in its action, for the first end of the cloth coming from the chemic bath into the bin is the last end out into the washer, and consequently one end of the cloth get a much longer treatment with the chemic than does the other end.

In the second process of bleaching knit goods in the roll which we will now consider, the chemic treatment is given by a different method. Instead of the goods being padded with the solution and then allowed to remain still for some time for the bleaching to take place, the cloth is run continuously in the liquor and the goods are practically not exposed to the action of the air at all. This process is coming more and more into use on account of its superior features. In the first place, the sequence of operations is not interrupted; when the goods are first placed in the bleaching machine they are run through the different operations of bleaching, washing, scouring and softening without interruption; that is to say, the goods do not have to be removed from the machine for any one of these operations. The following is the general method of procedure.

After coming from the boiling out kier the goods are run over a reel in a so-called string-tub machine. This machine consists essentially of a wooden or cement tub provided with a large reel at the back and a pair of squeeze rolls at the front. The rolls of knit goods are made up into separate chains, usually about three rolls of from 40 to 50 yards each to each chain, and machines varying in size from 8 to 20 chains are employed. The separate strings of cloth are run over the reel, down into the tub, and up to the squeeze rolls. Below the squeeze rolls are placed

a series of finger bars or partitions for the purpose of keeping the strings separate and from falling over one another. The back of the tub must be so curved that as the cloth falls from the reel it will pile up evenly and gradually fall downwards through the liquor in the tub. The front part of the tub is straight. The squeeze rolls and the reels should be so geared together that the reel runs slightly faster, so as to take up any slack in the cloth. The sequence of operations in bleaching in this form of apparatus is as follows:

First, a good washing is given the goods in the kier and also afterwards when they are placed in the machine and before the bleaching operation takes place. The wash water employed for this purpose in the kier should be hot and not cold. If cold water is used there will be danger of precipitating more or less the impurities which have been dissolved from the cotton, though not yet removed from the kier. The impurities existing in the cotton fibre consist mostly of so-called pectin matters. By the action of the alkali and oil which is used in the kier for boiling out these substances, a kind of saponification takes place. The resulting product is a brown, rather slimy mass which though soluble in warm water is not very soluble in cold water. Consequently, if cold water is run into the kier directly after the boiling out has taken place, there will be considerable danger of a precipitation within the folds of the goods of this brown pectin matter, and this may be rather difficult subsequently to get rid of, and may give rise to stains, and very likely manifest its presence throughout the entire bleaching operation. On this account it is strongly recommended to use hot water, especially in the first wash-off after the boiling out has been given in the kier, and before the goods are removed from the kier. This wash water should be circulated through the goods for about 15 to 20 minutes.

The string of cloth is then run out over a reel and into trucks which are divided into several compartments, each compartment being of such capacity as to take care of one string for the bleaching machine. It is not well to allow the goods to lie too long in these trucks before they are run onto the bleaching machine and wet out with water. Otherwise some parts of the goods are exposed to the air and as there is more or less of the impurities still existing in the goods which have not yet been removed, there may be an oxidation by the air which will cause a certain kind of brown stain to form. If the goods are left too long, especially in the moist and warm condition, they will also be liable to the formation of mildew stains. As soon as the goods have been removed from the kier and placed in these trucks the separate ends are then run over the reel in the bleaching machine and the machine filled up. Sufficient water must be placed in the bleaching machine to insure the proper running of the goods. This has to be guided by experience. Too much water will cause the cloth to float on the surface and thus cause the strings to become tangled. Also, if too little water is present in the machine the cloth as it falls down and folds over will pile up irregularly and the piles will fall over one on top of the other. This will also cause crossing of the strings and tangling. The proper amount of water will also depend on the weight of the goods, light-weight goods requiring a different volume of water from heavy-weight goods. This volume of water must in all cases be determined by actual experience in running the bleaching machine. It will be found to vary from a depth of 18 inches to 2½ feet, depending on the texture and weight of the cloth.

The goods now running in the machine are washed in lukewarm water for about 15 minutes before chemicing; and the goods being in the open condition there is a better chance for the water now to remove all the matters which have been decomposed in the kier. If there are any kier stains noticed it would be well to give the goods a preliminary soaping; that is to say, the first wash water should have a small amount of soap dissolved in it, and be at a temperature of about 140 to 160 degrees Fahr. Kier stains may arise from a variety of causes. Usually it is due to impure water. If pure filtered water is employed there is usually no cause for kier stains unless colored cotton has been used in the make up of the goods. Unfiltered water will nearly always give rise to trouble in the kier, either by reason of iron contained in the water which combines with the oil and alkalies to form a brown insoluble precipitate on the goods, or the stains may be caused simply by insoluble matter in the water which is otherwise known as plain mud. It must be remembered that any kier is really a filter on a large scale and the water which circulates through the kier is really filtered thereby, and any insoluble matter which may exist in the water will be caught up in the meshes of the cotton. On this account all bleaching establishments should filter the water they use, for however pure the supply of water may be considered, there will always arise occasions when filtering is not only desirable but necessary.

Nothing is so subject to variation as the water supply. In different seasons of the year, rain, heavy winds and other natural causes have a great effect upon the constituents and condition of the water, and the bleacher can only be assured of a constant quality in the water by proper filtering. For purposes of thorough washing in the string-tub machine a water spray pipe should run across the entire machine just in front of the goods before they pass into the squeeze rolls. The water passing out through this spray under a heavy pressure will be forced thoroughly into the goods just as they pass into the squeeze rolls. During the washing the drain valve should be allowed to be half open and fresh water should be continually admitted into the machine through the spray pipe while the dirty water is constantly running off.

Second, a treatment with chemic solution is given; this continues for about 40 minutes to one hour, and the strength of the bath varies from 1½ to 2½ degrees Twaddle, depending on the weight and the character of the cloth. For heavy-weight goods containing yarns which are composed of rather low grade cotton waste it will be necessary to use the stronger solution, for such cloth will be contaminated with a large number of motes or shives, or so-called "sticks," and these have to be removed by the action of the bleaching agent. For lighter weight goods composed of better yarns, it will only be necessary to run for a shorter time, and with a lower strength of the chemic bath. For heavy goods of low grade waste yarn the time of treatment should be for about 45 minutes cold, then the temperature of the chemic should be raised to about 110 degrees F. and the goods run for about 15 minutes longer. This treatment with the hot chemic is necessary to decompose and bleach out and destroy thoroughly the thicker motes in the yarn. For lighter weight fabrics which are

of a cleaner character, it would not be necessary to employ this hot chemic.

Extreme care must be taken not to let the chemic solution go beyond 110 degrees F., otherwise the oxidizing action of the chemic bath will be so great as to cause injury to the cotton fibre and it will also make the goods hard in feel as well as tender in strength. It will also be found that if the strength of the chemic is too great or if the temperature at which it is employed is too high, instead of the goods becoming whiter in color they will acquire a yellowish cast.

Third, after the treatment with the chemic solution has been completed, a thorough washing must be given to remove all excess of the chemic and lime compounds. Fresh water is run through the machine continuously while washing by means of the spray pipes, the waste valve being left partly open so that the wash water may run off. This washing after chemicing must be very thorough and be continued for at least 45 minutes or an hour. If insufficient water is employed or if the washing is not continued for the necessary length of time, various faults in bleaching may easily arise, and a great many defects in the bleaching of knit goods may be traced to insufficient washing after the bleaching operation.

Fourth, after this thorough washing has been given, it will now be necessary to give a treatment with "antichlor." This is nothing more than sodium bisulphite which is used for the purpose of neutralizing the chlorine compounds. The amount of antichlor necessary to be employed will vary from 3 to 5 per cent on the weight of the goods, depending, of course, upon the quantity of chemic solution which has originally been used. The amount of antichlor, however, should be ample, and after the goods have been so treated they should not show the slightest test of any presence of chlorine. This test can easily be carried out by pressing a piece of potassium iodide and starch paper on to the wet goods, or by moistening a portion of the goods with a solution of starch containing potassium iodide. The test paper of potassium iodide and starch is easily prepared by soaking strips of filter paper in a solution of starch containing some potassium iodide and allowing the paper to dry. This mixture of starch and potassium iodide is a characteristic test for the presence of even very minute quantities of chlorine. The slightest trace of chlorine when brought in contact with this reagent will develop a bluish to a black color depending on the amount of chlorine present. The treatment with the antichlor solution is in the cold and the time of running should be about 20 to 30 minutes. Sodium bisulphite is a very efficient antichlor by reason of the fact that the sulphurous acid it contains is readily oxidized to sulphuric acid, and since chlorine is a strong oxidizing agent they mutually neutralize each other.

Fifth, a thorough washing is again given after the antichlor bath has been run off from the goods. It must be remembered that in this antichlor or sodium bisulphite there is considerable acid, and it is necessary to remove all such acid, otherwise various faults will arise. The washing after the treatment with antichlor, therefore, must be very thorough and should be continued for about 45 minutes, employing a good flow of fresh water through the spray pipes and leaving the drain valve from the machine partly open so that the cold water is continually running away.

As far as the bleaching operations proper are considered this last souring or antichlor treatment completes the process. In many cases it will not be necessary to give any further treatment to the goods; but in some instances, especially where heavy and low grade materials are used, it will be considered essential to soften the goods before they go to the cutting room. The softening is produced by running the goods in a bath containing soap, or a mixture of soap and soluble oil, or even a suitably prepared softener. If considered desirable, the cloth may also be blued or tinted in this final softening bath by the addition of the necessary amount of bleaching tint. This is for the purpose of changing the tone of the white, giving it a bluish cast, which by some customers is considered more pleasing to the eye. The use of tinting agents, however, is not to be recommended in general. They add very considerably to the bleaching difficulties of obtaining even and uniform goods. Furthermore, very frequently, the tint which is employed is not especially fast, and after the goods have been stored for some time, they will lose this blue cast and return to their original color.

The advantage of this system of bleaching the cloth in string-tubs is that throughout the operation there is a uniformity of treatment through the whole length of the goods; and furthermore the cloth is in the open and floats through the liquor, so that it receives a very thorough treatment. Consequently, there is less danger of lack of uniformity of bleaching and the color is more likely to be even throughout the entire fabric. There is also less danger of the various faults of bleaching which we have considered in the other process. If properly conducted, and if the washings are very thorough, there should be absolutely no danger of the after tendering of the goods, or of the development of a yellow color on storing.

NOTES ON DYEING, BLEACHING AND FINISHING.

The Newest and Latest Chemical Facts From the Laboratories of the World. Prepared for and Contributed Exclusively to "Cotton."

BY J. MERRITT MATTHEWS, PH. D.

Dyeing of Manganese Bistre on Cotton Piece Goods.

The cloth is first padded in a solution containing 26 ounces of crystallized manganese chloride per gallon, after which it is dried in the hot flue and then run through caustic soda solution of 28 degrees Tw. After a slight rinsing the cloth is then hung up in the air, or passed up and down over rollers, to bring about oxidation. The oxidation may be completed by passage through a bath of bleaching powder, or better yet through a bath containing 3½ ounces of permanganate of lime per gallon. This not only completes the oxidation, but precipitates an additional quantity of peroxide of manganese on the fibre. The pieces are then washed in full width and dried. This process is a modification of that proposed earlier by Depierre, and is also very similar to that more recently patented Buschhuter (see Ger. Patent 239,308). The color obtained is a good bronze, but the shade depends largely on the length of time elapsing between the run through caustic soda and the final treatment with the permanganate of lime. (*See Zeitschrift fur Farben Industrie,* 1911, page 341.)

Practical Problems Discussed by Cotton's Readers.

We invite our readers to make use of this department for the discussion of any and all problems arising in the mill or the finishing plant. Questions, answers or letters need not conform to any particular style and will be properly edited before publishing. The editors do not hold themselves responsible for any statements of opinion or fact which may appear in this department unless so indorsed. This department is open to all.

IS THIS THE REASON?

BY T. L.

EDITOR COTTON:

In COTTON for May I read your correspondents letter entitled, "Why?" by W. B. W. and he describes in it a fault he had in a speeder, which he found was caused by a loose front roller. This roll, when repaired rectified the trouble, which was the slack sliver running every morning for a while after which it would come out all right until the next morning when it would again run slack.

There is one reason that would in my opinion cause it to commence running slack and then as the day advanced to begin to gradually take up again. We know that metal when cold will contract and when commencing to get warm will expand and that I believe would account for the variation in the running. In the morning it would be colder when not working during the night and after working a while would begin to expand with the warmth from working and therefore would not have the same backlash in the socket of the roll. As when starting up the first thing in the morning. Let us hear from others.

CAUSES FOR UNEVEN YARN.

BY E. C. BENNETT.

EDITOR COTTON:

I notice an interesting article by G. Kerwin on uneven yarn and the causes of it; but Mr. Kerwin does not state all the causes, so I will give a few thoughts along the same lines. In the first place cotton should be stored in a dry warehouse before going to the mixing room. There are many mills that store their cotton in open sheds and in some instances out in the open with nothing over it but old canvas, etc. When cotton is opened in the mixing room, we should have two seperate mixings and use alternately. Cotton should be allowed to dry out some before going to the openers. There is a certain amount of moisture in cotton so that it is necessary to keep the temperature of the opening and picking rooms the same as the cardroom. If cotton is not allowed to dry out it will make uneven yarn.

Mills often have improper dust-rooms, and some mills have the dust-room underneath the mill and very seldom cleaned out. If the dust-room, trunks, and chimney are not kept clean, it will create a back draft, which will make uneven laps as can readily be seen between the cages and calender rolls. There should be no obstruction whatever at the end of the trunks. The writer knows of instances where there was screens attached at top of the chimney to prevent the fly from blowing on the street, also one mill where the water pipe ran directly across the end of the dust trunk thereby causing a back draft which not only caused uneven work, but did not remove the impurities from the work as it should have done.

The opening and picking machines and dust-room should be thoroughly cleaned once a week. The picker men, in many cases, have to go out in the yard and do other outside work which is absolutely wrong as their time could be more profitably spent in the picking room. I do not attribute all the defects to the overseers as they do not always get the proper support from the management. In starting a lap on the finisher. there are always what are termed thick ends and more or less roughness, which will cause uneven yarn. The thick ends of the lap in going through the feed rollers of a card, raise the roller up a little causing the rest of the lap to be drawn suddenly in contact with the licker-in which displaces the settings all through the card and sometimes breaking the knife brackets, damaging the teeth of the licker-in, and bending the underscreens. Laps will run out on the best of card-tenders and with inexperienced help this evil is much worse, causing more damage to the cards than all other causes put together.

This evil can be entirely overcome by a simple attachment recently brought out by the writer and W. Broadbent It also prevents all obstructions from entering the feed roll. Now, because card manufacturers put different attachments on cards it is not always preferable to have them. For instance we will take the slow-motion on a doffer, which, when used, is a constant source of uneven work, as throwing on the slow motion will cause the cotton on the cylinder to make a heavier sliver during a few revolutions of the doffer. The opposite takes place when the card is put back on its proper speed. It is a well known fact that card sliver is lighter after stripping, so it is better to strip every other card. By allowing one card to make heavier strips than another will cause uneven carding so it is necessary to set the stripping plates so they will make about the same weight of strippings. The draft gear teeth which drive the feed-roll should be cleaned every time the card is ground, and set deep enough so it will not slip. The back plate not set properly will cause unevenness. Any depression on cylinder or doffer will make holes in the web, and as this happens every revolution this is a serious matter. In my next letter I will take up drawing, slubbers and fine-frames. I hope that the readers of COTTON will derive some benefit from this article, and will comment on any point of interest.

A report from an American consular officer in the United Kingdom states that a Brazilian residing in his district is anxious to obtain an agency in Brazil for an American concern. He states that he has had two years' banking experience, has been for seven years with English import and export merchants, and has also acted as factory manager for three years. He also adds that he speaks English, Portuguese, German, Spanish, and French, and is prepared to supply any references that may be desired. For further information apply to the Bureau of Manufactures, Washington, D. C., and refer to file No. 7953.

LANCASHIRE MANUFACTURING NOTES.

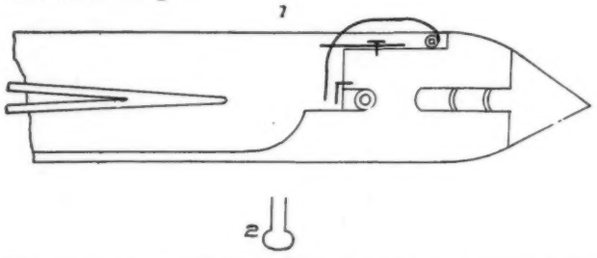
TWO NEW DEVICES IN USE IN ENGLAND.

(Contributed Exclusively to COTTON.)

BY F. W. HORROCKS.

All looms are not provided with warp stop motions, and even yet, many manufacturers when ordering new machinery, cling to the type of loom to which they have always been accustomed. The ordinary type of loom has, amongst its other disadvantages that of continuing at work though there may be a "float" going down through the weaver having her attention drawn away to another loom. The "float," which is a very bad place in the cloth caused by a broken end becoming entwined amongst the adjacent ends between the healds and the reed, is, next to a smash, the greatest source of anxiety to a weaver. In the case of a float, the weaver has to slacken the cloth, and if it has gone far she sometimes spends an hour or more in unweaving the damaged portion of cloth, and when the loom is restarted, there is often a thick or a thin place in the cloth which is as equally damaging to the piece as the original float would have been.

There have been many ingenious arrangements introduced having as their object the stoppage of the loom when an end is broken, and when a float is being woven, but these are sometimes too expensive or too complicated to suit some manufacturers. One simple and inexpensive way of bringing the loom to a stop when a float is forming is to cause the float to cut the weft. In the accompanying illustration, Fig. 1, the shuttle is practically one of the ordinary type but fitted with a bent lever which is pressed down by the ends forming the float and so breaks the weft, thus causing the loom to stop.



FIGS. 1 AND 2. THE NEW SHUTTLE AND THE END OF THE BENT LEVER.

On the end of the shuttle is a bent lever secured by a pin. The lower end of this bent lever is circular, fitting over the hole in the shuttle through which the weft is drawn. The bent lever is kept in position by means of a V shaped guide. So long as there is a clear shed the shuttle runs till the weft is used up; but when there is a float forming, the matted ends press the bent lever against a rubber or leather flap which breaks the weft. Fig 2 shows the end of the bent lever.

The above weft cutting shuttle is not the first one that has been tried in Lancashire, in fact, many attempts have been made on somewhat similar lines to bring out a shuttle that will stop the loom at the commencement of a float, but their liability to cause breakage of the yarn has prevented their adoption. The above shuttle, however, is entirely free from this danger and fulfils its object. This shuttle is patented by Thomas Booth.

In many weaving sheds it is almost impossible to come across a loom that will stop at the right time, or with the sley in the right position so as to be convenient for the weaver shuttling or drawing in the ends. This is sometimes the fault of fixer or tackler, but often is due to imperfect arrangement or condition of the brake. Fig. 3 is a loom brake patented by Thos. Arnold, which has been tried under the severest conditions and has proven successful. It can be arranged to stop on the first pick without throwing any great strain upon the loom. The whole arrangement is very simple in construction, and is not in the least inconvenient to the weaver. Little or no weight is required to be added to the lever to stop the loom quickly.

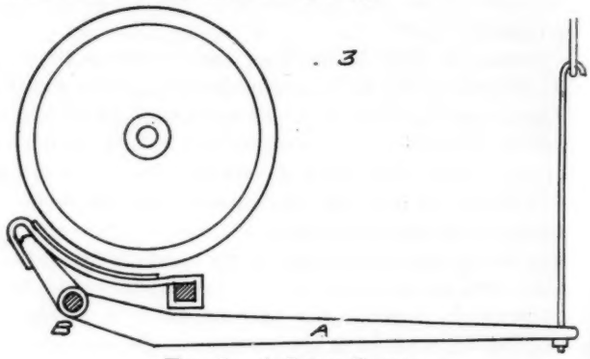


FIG. 3. A LOOM BRAKE.

The brake lever A is fulcrumed at B, and the short end of the lever fits into and operates the curved end of a steel strap which forms the brake. The front end of this steel strap rests upon a square stud. On the fall of the lever, the short end presses the steel strap against the rim of the wheel and aids in the stopping of the loom. The steel strap is provided with a strip of leather to act upon the wheel. Some brakes require a considerable amount of weight upon the lever, but in this one, owing to the great amount of frictional surface, and the extra leverage, very little weight is required.

SOME GENERAL SUGGESTIONS ON DESIGNING.

BY GEORGE RICE.

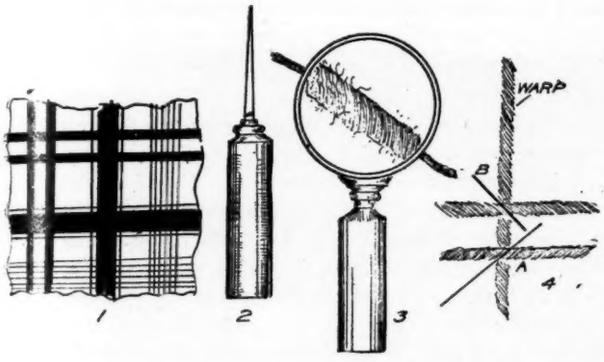
Years ago the masters argued that the only way that a young man could learn a trade was by the apprenticeship system. Boys were obliged to work at the forge or the bench a stated number of years without wages. Then as time passed and the lads gained experience a small salary was paid. At the end of the apprenticeship system the young man was figured as capable of doing his work.

In later years schools of instruction were introduced throughout the land. During the past dozen or more years quite a number of excellent textile institutions were started. Techincal instruction of all kinds, from making horseshoes to electrical devices, can be had at the various trade schools of the country. Many a young man has obtained quite a complete training in plumbing or cloth designing in one of these schools in a few years.

Within the past few years the textile and mechanical schools of correspondence have taken a hand in the matter. A young and enterprising student can be taught the theoretical part of cotton manufacturing or electrical engineering by mail. The beauty of the system is that the student can continue his regular labors and earn his living while he

studies the instruction forms of the correspondence school at night. Some very capable weavers, spinners, designers and dyers have been trained by the lessons sent through the United States mails. Today we have gotten to the period of press technical instruction.

The majority of people used to laugh at press articles on technical subjects. They would argue that the man who knows anything technical will not print it. That the press is full of reading matter written by persons not familiar with the practical work of the mill or shop. Few trained men subscribed for the industrial press with a view of getting instruction from the printed matter in the journal. But all of this has changed within the past few years. There are mechanical, woodworking, domestic engineering, textile, printing, flour and other trade journals whose contributors furnish thoroughly practical technical contributions for the readers. There are journals in which regular



courses of instruction are outlined each month. There are technical periodicals like COTTON that are doing enormous good in this direction, for they enable men and boys to sit down at the noon hour or at the evening meal and in a short time get some valuable technical instruction from their pages. Therefore, in this article we will undertake to give out some technical instruction to readers, the instruction to be along the line of cotton manufacture in the South.

The writer served a seven years' apprenticeship in the mills of Lowell, Mass., years ago. He has a diploma from the designing department of the Massachusetts School of Design in the Massachusetts School of Technology, date of 1882. He has worked as fixer, section hand, boss weaver, designer, assistant superintendent and at one time was part owner in a little mill.

The beginning is at the point where the manufacturer, the agent, the superintendent, or the boss weaver receives a sample of cloth and is told to go ahead and make a certain number of thousands of yards of the goods. In the large mill, the designer will handle the matter. He will dissect the sample and ascertain just how it is made, and just what must be done to reproduce it. In the smaller mill, the work may fall to the superintendent. Sometimes this party is too busy and turns the job over to the overseer of weaving. The overseer of weaving has been known to set the second hand to picking out the goods and making the warp and filling chain to manufacture the same. The second hand may call on the fixer to help out. The boss dresser is appealed to for the purpose of getting at the number of threads in the warp and the lay-out of the same. In mills where the system is not perfect, the spinner may be called to join the group to make a guess on what number of yarn to use and so it goes. Uultimately the goods are turned out, but they differ from the sample and the commission house may refuse to accept the goods unless a liberal discount is made.

Hard, costly experience has inspired men to get things right in the textile manufacturing business. Hence, in the well systematized mill the sample fabric is taken in hand by a competent party and the process of analysis proceeds correctly. Figure I represents the sample. I would not undertake to accomplish anything without the necessary devices. Get a picking out tool, figure 2. You can buy these ready made at the dealers in mill supplies, or you can have the local machinist put a steel point into an awl handle. Buy a magnifying hand glass like that in figure 3. You can then enlarge the sample, the yarns and the weave at will.

The use of the glass is illustrated in the little point of twist in the warp and filling yarns. If the warp yarn is twisted to the right and the filling yarn twisted the same, there will be a break in the crossing of the yarns, as at A figure 4. But if the warp is twisted to the right and the filling to the left, the fibers in each system of yarns will lay in the same direction, as at B and the intersection will be tighter and smoother.

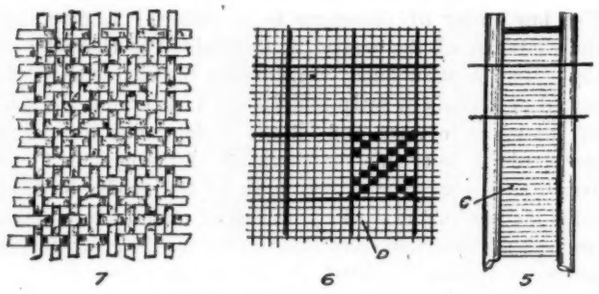
In the sample at hand, you first determine the weave. The best order of procedure is as follows: 1, determine the character of the weave; 2, determine the character of the cotton or other fiber; 3, determine the character of the layout of threads of warp and filling; 4, determine the sizes of the yarns in warp and filling; 5, determine the weight per yard; 6, determine the character of the dyeing; 7, determine the character of the finish of the goods; 8, determine the cost of the stock, processes of manufacture, finish, and sale; 9, determine how best to prepare the goods for the home or foreign markets; 10, determine prices and who shall handle the goods to be sold; 11, determine on what advertising to do in order to make an active demand for the goods; 12, determine how to increase the importance of the products of the mill, development of capacity, addition of machinery and possibilities of increased dividends, etc.

The determination of the structure of the fabric is effected by an examination of the same. The sample at hand may be exceeding small, in which case considerable care has to be taken in order to preserve the plan. If the threads are matted, it will be difficult to separate them. Often the fine threads get packed so securely that only the trained man can open the strands. The sample may be free and large, in which case you can handle the goods to better advantage. The direction of the warp in the sample can be determined by the nature of the threads. The hard-twisted threads are the warp threads and the softer twisted threads are the filling threads. Then again you can determine the way of the warp in the sample by the reed marks. Figure 5 is a reed, showing an inch divided off at c. Here we can count the number of splits within the inch and the number of splits can be multiplied into the number of threads in each split, thereby giving as a result the number of warp threads in one inch of the goods. You have to allow a little for shrinking of the cloth.

The sample you have at hand is to be reduced to a weave plan that will be comprehensible to the experienced designer, manufacturer, cloth-student, overseer of weaving or the fixer who must plan the harnesses and get the warp threads drawn into the reed for weaving.

While some men roughly square off a number of blocks in pencil or ink on common white paper, other men are more careful, and use only prepared designing paper. The designing paper, all ready squared off can be bought at dealers in artists' materials. There are various sizes of squared paper. Some of the little squares are too small for practical use. Others are larger than necessary. The medium squared paper is shown in figure 6. The sizes of squared paper include numbers from 4 by 8 to 10 by 14. The eight by eight size is very convenient and is used very extensively by the cotton mill designers. It is easy to make the plain cotton weaves, the twills, the basket and granite weaves on the eight by eight designing paper.

It is a good plan to possess a complete designing cabinet. You can buy such a cabinet with all the necessary devices. It will include the picking out tool, the magnifying glass, the assortment of squared paper, etc. With the paper and instruments at hand you can proceed to define the structure of the texture. If it is plain goods, there will not be much bother with the preparation. But there are two and three ply goods, and goods in which there are a number of colors in the warp and the filling. These must



be classed accordingly. Fig. 7 shows the nature of the weave in the plain, foundation cotton weave. From this foundation weave we get the more complicated designs. In the plain cotton weave the threads merely rise and fall alternately. The design in Fig. 6 is a twill. There are many twilled weaves in use in the mills at present. Twilled goods are popular. There are the three-harness twills in which three harnesses perform the work and repeat the pattern. The four leaf twill calls for four harnesses and the six harness twill requires two more. The twills are always in demand as is known to the trade. Still the demand calls for broken twills, ribs, basket effects, long diagonals, etc.

The party preparing the paper simply picks it out and gets it on paper so that someone else can read it. Some of the best designers in the profession get puzzled over the patterns at times. I have known grey-haired designers to give up certain samples as hopeless. You take a sample of goods in which the yarns are hard-woven and felted together and you will have some trouble in making a plan of the composition. The average sample, however, can be arranged and reproduced by men who know their business. In the technical schools in which designing is taught, the students are instructed in the art of retaining their patience when working over complicated goods. Patience and care count for a great deal in the puzzling problem of finely woven, hard-felted samples.

A Japanese steamship company is being organized to further commercial exploitation in the South Sea Islands.

A new jute substitute which is now being marketed in Germany is attracting attention in the textile trade there. The process, which is a patented one, is a modification of that for the manufacture of paper yarn, but the new product is said to be much stronger owing to the incorporation of cotton waste, and is much easier to weave. The process appears to be well backed financially. Fuerst Henckel von Donnersmark, who has played a leading part in developing the manufacture of viscose artificial silk in Germany, being interested in it. A small shed, containing 150 special looms, has been running at Oppeln, and the plant is now being doubled. Sacks made from the new material are said to have given satisfaction, being dust proof and particularly well adapted to cement packing. The present price is about 20 per cent below that of corresponding jute goods, and under existing conditions there is stated to be a profit of over 100 per cent, and if this is so any decline in jute prices could be easily followed. Whether extended trials will justify the expectations of producers remains to be seen, but developments will be watched with interest.

The report just issued by the Glanzfaden Akt.-Gas., Berlin, discloses a net loss for the past year, the first complete working year of the undertaking, of 43,147 marks, against a net loss the previous twelve months of 11,917 marks. The company was formed in 1910 to work the linkmeyer artificial silk patents. The capital is 1,000,000 marks. The First Austrian Glanstoff Company is paying a dividend of 10 per cent, as before. The report states that the past year was not a very satisfactory one, and complaints are made that owing to the lack of any import duty on artificial silk in Austria, producers there are very unfavorably placed with regard to meeting foreign competition, which is now very keen. Fortunately consumption has increased at a very rapid rate, artificial silk being now employed to a quite unexpected extent in the weaving industry. The undertaking has hitherto worked the guncotton process, but a plant for the viscose method is being laid down, and will be ready shortly. It is stated that this will place them in a much better position to cater for the weaving trade. Mention is made of the formation of the artificial silk syndicate, the object of which is said to be to steady prices. The marked increase in the use of artificial silk in weaving is indicated very clearly by a statement made at a meeting of the Crefeld Chamber of Commerce on March 30 last, the consumption of artificial silk by piece goods manufactures in the district last year being said to have been 164,546 kilos, against 30,251 in 1910, and it is thought that the current year will show another very decided increase.

The net increase in the number of spindles in Lancashire during 1911 was the lowest since 1902. During the year 137,785 spindles were added to those in operation in the county. There was, however, a substantial addition of 17,452 looms, the largest increase since the year 1906. The chief increases in spindles are Oldham, 95,147; Blackburn, 52,156; Bolton, 32,500; Accrington, 23,204; and Wigan, 10,440. The chief extensions in looms are: Burnley, 4,564; Nelson, 2,010; Clitheroe, 1,506; Hyde, 1,332; Bolton, 2,222; and Ashton-under-Lyne, 1,026. Throughout Lancashire there are now 758,712 looms.

He who wastes an hour in the morning may search through the rest of his life but will never find it.

NEW MACHINERY AND TRADE NOTES.

AN ATTRACTIVE EXHIBIT.

The third exhibition of textile machinery and allied products was held by the Textile Exhibitors Association during the week of April 22 to April 27 at Mechanics Building, Boston, Mass. On Wednesday and Thursday the National Association of Cotton Manufacturers held its annual meeting in the same building. This opportunity for a meeting of makers of the latest and best cotton machinery with the leading cotton manufacturers of the country was of mutual advantage to all concerned.

The floor space was engaged long in advance of the exhibition. Crowds were in attendance each day of the week. It was estimated that more cotton mill people were present than were ever before together on any similar occasion.

ONE VIEW OF THE EXHIBIT OF THE DRAPER CO.

The exhibit of the DRAPER COMPANY of Hopedale, Mass., one view of which is presented herewith, was a very complete one and received much praise from the visiting mill men. It included four Northrop looms; a tape driven twister; a spooler with a new traverse motion; two warpers; a balling machine; a Moscrop yarn testing machine; Dutcher temples; Duckworth traveler magazines; MacColl spooler guides; Smith twister stop motions; Rabbeth centrifugal clutch spindles; mirror spinning rings; and other specialties.

The DRAPER COMPANY service to its Northrop loom customers in the line of repairs and supplies means more than the mere sale of a few dollars worth of goods from time to time. They are interested in the results obtained on Northrop looms and to have all Northrop loom customers obtain the greatest product, the most perfect quality and lowest weaving costs possible. Northrop looms by their capacity for continuous operation without weavers at noon and at other times can be made to show more than one hundred per cent product. This company has weaving experts available both North and South whom they will be glad to send to Northrop loom users when requested.

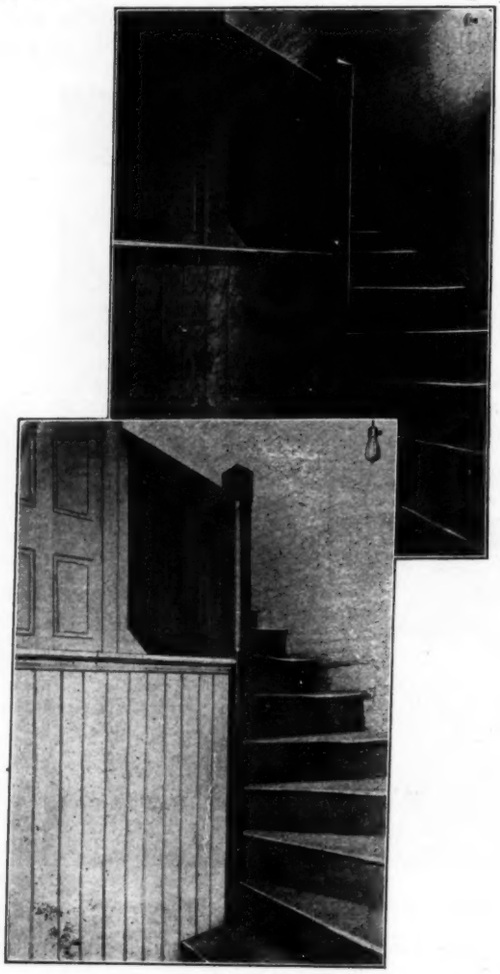
Combination tanned belting, manufactured and sold by THE NORWICH BELTING COMPANY, Norwich, Conn., will drive with far less tension than most any other belting. It has greater tensile strength and is more pliable, and has proved most satisfactory wherever tried. It is used extensively for cones, mules, motors, universal winders, and spinning frames in cotton mills, for speeders in woolen mills, and for drop hammers and all hard work, as well as for main drive belts. They also make combination tanned solid round belting, for sewing machines, trolley cars, and all kinds of machines where round belting is used. The special features of both the flat and round belting, are tensile strength, flexibility and durability. A card to the manufacturer will bring you interesting information that will help cure your belt troubles.

As any blower in a mill heating system can easily give more efficient results when placed near the air supply it would seem preferable to install it at the inlet and handle the air before it is heated.

LIGHT IN THE KNITTING INDUSTRY.

Knitting mills, in common with other manufacturing plants are able to produce a much better quality of product, and a much larger quantity of first quality product, when the work is done in well lighted interiors where the operatives are able to work at all times to the best advantage. Not only, however, should the work room be thoroughly lighted, but also the dark corners, the stairways, hatchways, passages, elevator shafts and other places that are so prone to become the receptacles for dirt and waste.

There is, perhaps, no one thing which so impresses an insurance inspector, and which wields so much influence with him toward turning in a favorable report, with perhaps a lowering of rates, as to find a mill without dark



corners and therefore without dirty corners. The influence of good, clean, well lighted passage ways and work rooms also have a distinct moral effect upon the operatives who naturally tend to themselves adopt better habits. A man who chews tobacco will wait until he gets outdoors to spit if the corner in which he is accustomed to spitting is all clean and white as is the case when it is painted with Rice's Mill White paint. If the corner is dark and no one can see the effects of his spitting, he does not hesitate but expectorates, not once only, but everytime he passes that particular corner. This moisture and filth catches cotton lint and similar substances and in a little while the corner is in a foul condition that is never discovered except by the aid of a dark lantern. Moral, use Rice's Mill White.

As an illustration of how this paint will light up dark corners and stairways we reproduce herewith a stairway in the plant of the Knotair Hosiery Co., of Philadelphia, Pa., the top picture represents the stairway before painting and with the electric light burning while the bottom picture shows the stairway after the walls were treated with Rice's Mill White. No electric light is needed in this picture as every corner stands out prominently and accumulated dirt in such a stairway is naturally a thing unknown. This mill management was so much pleased with the improved appearance of their mill interior that they wrote the manufacturers of Rice's Mill White paint the following testimonial letter:

Philadelphia, Pa., April 18, 1911.

The U. S. GUTTA PERCHA PAINT CO.,
Providence, R. I.

Gentlemen:—

The interiors of our mills are painted throughout with your Rice's Mill White, and we are indeed astonished to note the vast amount of daylight created by this paint, especially in such parts of our mills as hatchways, etc., where we were formally forced to use electric lights all day, but now find it entirely unnecessary, due solely to the use of your paint.

The writer has used this paint for the interior of the conservatory at his home, and is agreeably surprised to observe how easy it is to keep clean.

We emphatically recommend your product, and heartily wish you the success you are bound to achieve.

Yours very truly,

KNOTAIR HOSIERY COMPANY.

AN ELABORATE WEAVING DISPLAY.

The STAFFORD COMPANY'S exhibit at the Third Textile Exposition at Boston was the most extensive in the hall, occupying the entire south-western side. They showed eleven looms, ten "Ideal" automatic and one silk loom. These were weaving a wide range of goods, including fine voile, cotton warp and silk filling, fancy silk, lawns, bags, broad sheeting, worsted, denims, terry towels, jacquard patterns and heavy duck. It was the most extensive exhibition of its kind ever shown in this country.

As the visitor approached the Stafford Company's space the first loom he saw was a standard Stafford silk loom, equipped with a twenty harness dobby, making a very beautiful piece of printed taffeta, 36 inches wide, 6,000 ends in the warp and 100 picks to the inch. This loom had all its bright parts nickel plated, and presented an unusually fine appearance.

No. 2 was an automatic cotton loom with a 70s warp and 60s silk filling. Speed of loom 145 picks per minute. Construction of cloth 76x76. The silk filling was wound on paper tubes by the Universal System. This loom was equipped with a feeler motion and made practically perfect cloth.

No. 3 was the new 1912 model and had embodied in it the very latest ideas in loom design and construction. It was making a standard sheeting 28s warp, 44s filling, 80x80, and was running at a speed of 165 picks per minute. In order to demonstrate the Stafford claim of adaptibility to all conditions this loom was running with both cop and bobbin filling alternately in the same magazine.

No. 4 was a fine voile loom. Many able manufacturers have labored under the impression that automatic looms were not suited for goods of this variety. This loom gave a practical demonstration of the error of this view point. It was making a very beautiful voile, 100s/2 warp and 100s/2 filling, 64x60, and turning out an irreproachable piece of goods.

No. 5 was a special type of "Ideal" automatic loom for making bags. They were made complete on the loom, both sides and bottom being woven in. The construction of these goods is warp 22s and filling 44s, 64x68.

No. 6 indicated another new use for an automatic loom, the making of terry towels. The top warp was 20s/2 and the bottom warp 30s/2; the latter was the ground warp. This loom was running at 150 picks per minute. On account of the unusual nature of this weave the loom received a great deal of attention from practical mill men who have never before seen such goods made on an automatic loom.

No. 7, was a broad sheeting loom making a piece of standard 90 inch sheeting, 20s warp, 28s filling, 68x72. This loom was running at 103 picks per minute and was one of the finest appearing looms of all. In its construction it included the latest Stafford ideas in loom building, with improved form of take up motion, picking motion and let off.

No. 8 was a duck loom for making up to 14 ounce ducks. The goods the loom was making were 12 ounce goods, 30 inches wide. This loom weighed over 3,000 pounds and was running at a speed of 145 picks per minute. The loom was equipped with feeler motion and was designed and constructed from the ground up especially for making this class of goods. It was a strong rigid machine and made an unsurpassable grade of goods.

No. 9 was a 63 inch worsted loom of the automatic type and was a fair example of the wide range of these looms. It was making a piece of worsted dress goods on 4 harnesses of a quality that no plain loom could excel. The loom was equipped with a feeler motion and was running at a speed of 130 picks per minute.

No. 10 loom was making a three harness blue denim for overall goods. It was also equipped with a feeler motion and was running at a speed of 168 picks per minute. It was running on bobbin filling but like all "Ideal" looms could run equally as readily with cop filling.

No. 11 was a jacquard loom making a figured fabric with a plain warp and red filling. It was also equipped with a feeler motion and attracted especial attention on account of the unusual nature of the goods. The diversity of product that these looms are capable of handling could not be better exemplified than by this loom.

A NEW HOLLOW METAL BASE BOARD.

A new, original and thoroughly tested device for boarding and drying hosiery without the use of a dry box is known as Ermentrout's oval hollow metal hose board. The claims for this device which has recently been placed upon the market, is that it saves time, labor, steam and power. These boards are mounted in a stationary position at the proper angle upon the regular boarding table. Steam at only four pounds pressure will furnish 220 degrees of heat which is ample and a pressure regulating valve keeps the pressure and the heat uniform.

In operation with a table equipped with a dozen or more boards, the boarder starts at one end of the line putting the hose on the board. So rapidly is the drying accomplished, that by the time he reaches the seventh or eighth board, his helper can begin to remove the hose in the order in which they were put on, thus insuring continuity of operation. It is claimed that the operation of boarding is quicker than by the old method, as the boards are stationary and do not have to be handled. Being of polished metal the stockings slip on and off easily and there are no rough or splintered edges to tear or damage goods.

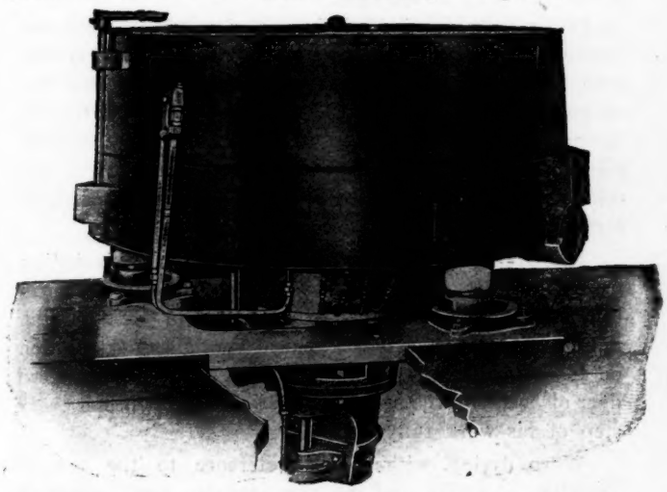
Another feature which is claimed for this device is that the stocking is dried from the inside which is an especial advantage in the manufacture of silk hosiery. Another advantage in the making of silk goods is the doing away with pressing and consequent saving of time as the goods are ready for boxing as soon as they come off the boards.

W. D. BUTZ, Room 625 Bourse Building, Philadelphia, is handling these boards and they will be sent on trial, providing the manufacturers desiring to try the boards will comply with a reasonable set of conditions as to installation. These conditions, together with guarantees, prices, etc., may be secured upon application to Mr. Butz.

A NEW OPEN TOP EXTRACTOR.

We present herewith an illustration of the new Tolhurst open top hydro extractor driven by direct connected electric motor. The motors have high starting torque and are wound for either direct or alternating current. Starting devices, either hand operated or automatic, with time limit or current limit characteristics may be used.

The three bearings which allow the case to oscillate are entirely under the case and out of operator's way. This allows trucks to be run close to machine at all points.



The mechanical oiling device makes the lubrication of all bearings positive. A centrifugal pump directly connected to the basket spindle, which can be run either direction, throws a stream of oil into the bearings which then flows back through a fine screen to oil well and is used over again.

The mechanical perfection with which these machines are constructed is in every way in line with the usual Tolhurst methods. All those interested and desiring further information may receive catalogue, etc., by applying to the TOLHURST MACHINE WORKS, of Troy, N. Y.

D. D. Felton, of Manchester, N. H., J. B. Fitch and M. A. Knipe, of Atlanta, Ga., are incorporators of a new business to be located in Atlanta. These men have bought the brush plant of Geo. E. McMurray and are fitting out a complete factory for the manufacture of all kinds of brushes. Particular attention will be given to the re-filling and repair of cylinders, cards, and tentering brushes for the mill trade. Mr. Fitch, the manager of the new company, has had eighteen years of experience with the S. A. Felton & Son Company of Manchester, N. H., and locates here in the South fully determined to establish the output of the new company upon as high a standard of quality and excellence. The new factory is located at 200½ Marietta St. Atlanta, Ga.

As a reliable sizing for warps THE ARABOL MFG. CO., 100 Williams St., New York, recommend their "Sizeoleum." It does not call for the addition of tallow. Southern manufacturers, in particular, are greatly pleased with it. It gives unexcelled results on warps for gray goods of the export grade and for converters' goods. Used with starch, (Arabol standard sizing starch), it works splendidly as a sizing for warps for sheetings, printcloths, shirting, duck and similar goods.

MANUEL OF DYEING, Published and distributed by the Cassella Color Co., 182 Front Street, New York.

A new and very much enlarged edition of the first volume of the Cassella Color Company's Manuals of Dyeing has just been issued from the press and far exceeds the first edition in scope of contents and variety of technical matter. It covers every phase of the application of the ordinary coloring matters to cotton in every stage of manufacture and in consequence will be found of extreme value to the practical cotton dyer, in whatever branch of the industry he may be engaged.

The volume is divided into eight distinct sections covering the general directions for the application of cotton colors, including special technical directions regarding the exhaustion of dye-baths, the matching of after-treated dyeings, the various phases of dyeing certain immedial colors and the new and important group of Hydron or vat colors, together with the practice of bleaching piece goods containing Hydron Blue, etc.

The dyeing of loose cotton and cotton yarn, including mercerized yarn, is fully described and is one of the most complete sections of the work. Owing to the growing importance of dyeing in mechanical appliances, the section on machine dyeing is quite up to date and the advanced dyer of cotton in the usual commercial forms will find every step of his work fully covered.

Warp dyeing, with special reference to the use of Diamine, Immedial and the new Hydron, "vat," colors is likewise very complete, together with important notes on the dyeing of warps in dressing. The dyeing of knit goods and hosiery is fully treated and special attention is given to the details of the preparatory treatment of this class of goods. The section on piece goods is very complete and the jigger, padding machine and continuous dyeing machine methods are amply treated.

The seventh section will be found very interesting on account of the wide variety in vegetable fibers and fabrics made therefrom there discussed and described, the dyeing of artificial silk being very thoroughly covered. The volume closes with a supplement containing the usual conversion tables, thermometer and hydrometer scales, weights and measures, etc., and a very complete index.

TURNER, TUCKER & Co., Bankers, 24 Milk St., Boston, Mass., have just issued a special stock, bank and trust company circular containing the latest compilations of New York, Boston, and Philadelphia bank and trust company statements for comparison and also much other valuable information which is relative to investment securities.

The old time belief that low interest bearing municipal bonds were the only safe "unlisted" securities available for conservative investors has now been effectually dispelled. The creation of many public service corporations, incident to the commercial development of new inventions and the improvement of old ones—electric light, gas, street railway, telephone and the like—together with a great expansion of industrial operations, has brought into the market a large class of high grade investment securities which, though unlisted, possess—in many cases—greater merit than do the long list of Stock Exchange issues.

Briefly summarized preferred stocks—listed or unlisted—possess practically all the merits and few of the disadvantages of a bond issue. They are usually a first lien in liquidation on property and assets; in many cases they share equally with the underlying securities in voting rights, in determining the management and in fixing the methods of handling the business; they are assured of a fixed return and their worth is enhanced by any business expansion that may be had. Their market is always broader and better than that of a bond and the holder need never take into account approaching maturity dates in estimating their real value. Unlike a bond, they are freed of a mass of legal technicalities and heavy expenses in the event of liquidation. In short, preferred stocks of genuine merit get practically the full benefit of the company's earning development without sacrificing anything in return for safety of principal.

Persons interested in this special circular may secure a copy by applying to the Boston office of the company.

Bolivian Tariff and Appraisement Schedule, published by the Pan American Union of which the Hon. John Barrett is Director General, Washington, D. C., 157 pages bound in paper.

This booklet which is published under date of March 1st, 1912, is a revision of the original schedule which was revised, translated and published by the Pan-American Union in its bulletin for June 1906. Since that time new modifications in the tariff schedules of Bolivia have made necessary a new revision of and addition to this tariff. In consequence, the Bolivian Congress on February 4th, 1911, enacted a law revising in general the tariff schedule and incorporating in the revision modifications made since the general revision of 1905. In this book these schedules appear with all the changes up to date in both English and Spanish. With no other country in South America has the trade of the United States in recent years increased so rapidly as it has with Bolvia, particularly imports to Bolivia from the United States. Ten or fifteen years ago American goods were almost unknown in Bolivia and even in 1904 when the trade had assumed some considerable proportions, it was only about $432,000. In 1910 it was equal to $2,-